HELSINKI SCHOOL OF ECONOMICS (HSE)
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STOCK MARKET EFFICIENCY IN THE CEE-COUNTRIES AND RUSSIAN STOCK MARKETS THROUGH THE LENS OF CALENDAR ANOMALIES

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ABSTRACT
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Objectives of the Study

The purpose of this study is to present the underlying financial theories and to introduce as well as to discuss earlier international studies on the calendar anomalies. The primary objective of the thesis is to examine whether the four different calendar anomalies: day-of-the-week, month-of-the-year, turn-of-the-month and Halloween effects exist in stock markets of Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russia, Slovakia and Slovenia. Furthermore, thesis aims to examine the persistency of these phenomena, which enables the estimation of stock market efficiency development.

Data and Methodology

The theoretical part of the paper is derived from the contemporary finance literature. The data set of the study comprises from daily price level return series of respective stock market indices from January 1997 to February 2008. For persistency analysis the indices are studied as a full period and three sub periods. The existence of calendar patterns is tested using the Ordinary Least Squares (OLS) regressions. Statistical tests are applied to confirm the significance of the observations.

Results

The CEE-countries and Russian stock markets are weakly efficient in terms of day-of-the-week and month-of-the-year anomalies. The turn-of-the-month effect is detected in Croatia, Hungary, Poland, Romania, Russia and Slovenia. In these countries the average 5-day turn-of-the-month yield accounts for 85% of the monthly return. Trading strategy based on the Halloween effect produces statistically significant abnormal returns in the Czech Republic, Estonia, Latvia, Lithuania and Russia. However, calendar anomalies show signs of declination throughout the sample period and the weak form market efficiency increases gradually in all examined countries.

Key Words

Market Efficiency, Anomalies, Seasonalities, Day-of-the-Week, Month-of-the-Year, Turn-of-the-Month, Halloween, Transition Economies, Emerging Markets

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Rahoituksen tutkielma
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TIIVISTELMÄ
5.5.2008

OSAKEMARKKINOIDEN TEHOKKUUS KESKI- JA ITÄ-EUROOPAN SEKÄ VENÄJÄN PÖRSSEISSÄ KALENTERIANOMALIOIDEN NÄKÖKULMASTA

Tutkimuksen tavoitteet

Tutkimuksen pyrkimyksenä on esitellä rahoitusteorioita ja tutustuttaa lukija aiempaan kalenterianomalioita käsittelevään kirjallisuuteen. Tutkielman ensisijainen tavoite on tarkastella esiintyykö viikonpäivä-, kuukausi-, kuunvaihde- ja Halloween-anomalia Bulgarian, Kroatian, Tsekin tasavallan, Eestin, Unkarin, Latvian, Liettuan, Puolan, Romanian, Venäjän, Slovakian ja Slovenian pörsseissä. Lisäksi tutkielma pyrkii arvioimaan näiden ilmiöiden jatkuvuutta, mikä mahdollistaa osakemarkkinoiden tehokkuuden kehityksen arvioimisen.

Tutkimusaineisto ja menetelmät

Tutkielman teoreettinen osa perustuu rahoitusteoreettiseen lähdekirjallisuuteen. Tutkimusaineistona käytetään kunkin osakepörssin hintaindeksin päiväkohtaisia logaritmisoituja tuottoja ajalta 1.1.1997–29.2.2008. Ilmiöiden pysyvyyden analysoimiseksi testejä tehdään sekä koko aineistolla että kolmella erillisellä aliperiodilla. Anomalioiden esiintymistä tutkitaan pienemmän neliösumman menetelmällä (OLS), ja tilastollisia testejä käytetään havaintojen merkitsevyyden määrittämiseen.

Tulokset

Keski- ja Itä-Euroopan sekä Venäjän pörsseissä ei esiinny tehokkaiden markkinoiden heikkoja ehtoja rikkovia viikonpäivä-, tai kuukausianomalioita. Kuunvaihde-efekti esiintyy Kroatian, Unkarin, Puolan, Romanian, Venäjän ja Slovenian osakemarkkinoilla, missä keskimääräisen 5-päivän kuunvaihdetuoton osuus koko kuukauden tuotoista on 85%. Halloween-anomaliaan perustuva sijoitusstrategia generoi tilastollisesti merkitseviä ylituottoja Tsekissä, Eestissä, Latviassa, Liettuassa ja Venäjällä. Tästä huolimatta, tutkimustulokset osoittavat, että kalenterianomaliat vähenevät kauttaaltaan tarkasteluperiodin aikana. Näin ollen, heikkojen ehtojen mukainen markkinatehokkuus kasvaa asteittain kaikilla osakemarkkinoilla.

Avainsanat

Markkinatehokkuus, anomaliat, kausivaihtelu, viikonpäivä-, kuukausi-, kuunvaihde-, Halloween-anomalia, siirtymätaloudet

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1 Introduction

Calendar anomalies have been a world-wide topic of academic research for over half a century. Surprisingly, these market phenomena seem to be persistent after all these years even though various efficiency and arbitrage pricing theories argue that these seasonal patterns and profit possibilities should not subsist or should be only minor after their discovery. Financial theories state that seasonalities are consequences' of inefficiencies in pricing. However, in an efficient market, investors are expected to start exploiting these market trends by taking controversial measures. These actions should drive market prices towards the equilibrium in a way that the anomalies should disappear.

Nevertheless, there is a considerable volume of literature that documents several constant and potentially exploitable seasonal anomalies in stock returns that challenge the Efficient Market Hypothesis (EMH). According to recent studies these pricing inconsistencies are still found in different markets despite the fact that calendar anomalies are commonly acknowledged by the market participators. These seasonalities or calendar anomalies comprise of intraday, day-of-the-week, month-of-the-year, turn-of-the-month, holiday, Halloween and lunar cycle effects, among others. Whereas calendar patterns in advanced equity markets have been investigated extensively, the transition economies have received less attention. There are studies concentrated on some specific seasonality effect in Asian, South-American and some of the Central and Eastern European (CEE) markets but not a detailed investigation that would provide an understanding of the possible calendar anomalies phenomena in the transition economies as a whole.

The term "transition" describes the changes taking place in the economies of Central and Eastern Europe following the collapse of the Soviet Union. Transition portrays the development of transforming an economy from plan to market and involves concurrent dislocation in economic behavior in addition to major changes in multiple aspects of the economic system. Fundamentally, transition entails discontinuity in the structure of opportunities as well as incentives and is identified by major institutional, legal and political changes in the economic system. Among other evolvements, the process of

transition implies the institution of private property and the formation of markets to value newly privatized firms. (Harrison and Paton, 2005.) Considering the underlying challenges, as the transition involves creating a modern capital market from scratch, these economies provide a fertile ground for exploration of stock market irregularities.

This paper conducts an investigation regarding the existence of calendar anomalies in stock markets of the following transition economies: Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russia, Slovakia and Slovenia. Particularly, study concentrates on determination of prevalence of the four aforementioned anomalous patterns i.e. day-of-the-week, month-of-the-year, turn-of-the-month and Halloween effects in the respective markets.

Day-of-the-week effect implies that return generation process is not evenly distributed across the week in stock markets. Existence of this anomaly is commonly contributed to weekend holidays in addition to the timing of investors' asset management planning. The intermission in trading (during the weekend) is alleged to lead to negative returns on Mondays and escalation of equity prices towards the weekend. However, day-of-the-week pattern is observed also on Tuesdays or even Wednesdays in some smaller European markets. Month-of-the-year effect indicates that there are superior months such as January delivering higher yields on average in comparison with other months of the year. This effect is associated with taxation arrangements and changes in the investors' liquidity during the year, causing fluctuations in capital flows and consequently the demand patterns for securities. The turn-of-the-month effect entails that mean proceeds around days during the turn-of-the-month are greater than on other days of the month. This pattern is also attributed to deviations in investors' liquidity and clustered information release of macroeconomic news announcements. Finally, the Halloween effect suggests that due to differences in monthly patterns there is a possibility to obtain abnormal returns by employing a market timing strategy.

Besides assessment of calendar anomalies subsistence, this thesis addresses the persistency of these phenomena, which enables to estimate the level of stock market

efficiency achieved in the studied economies. There are several reasons to assume that the efficiency of capital markets in transition economies should increase over time. In the first phase of a recently created market, trading is thin, the regulation imposed on firms' disclosure requirements is merely narrow whereas the chances for market partaking are neither well distributed nor thoroughly comprehended by many prospective investors. Under these conditions the behavior of market participants is not likely to correspond with the efficient market theory. However, the majority of countries under investigation have accessed the European Union during the sample period. As members they are nowadays obliged to follow regulation applied on western capital markets, which should induce the evolvement of market efficiency. Thus, studying for calendar anomalies in transition economies is a subject of particular interest.

In the next section study aims to motivate the reader by emphasizing its approach to anomalies and by unfolding how it distinguishes from previous research. Following the motivation section the introduction precedes to presentation of the research questions. Lastly, the introduction will put forward the structure of the study in its entirety.

1.1 Motivation for the Study

The Central and Eastern European (CEE) countries and Russia have been a subject of great interest for institutional as well as retail investors during the last decade and the beginning of 21st century. The increasing attention can be explained by a strong economic growth in these countries and soaring returns on investments that the transition economies have been providing in comparison with somewhat more stable returns in mature markets. The other reasoning for increased attention is that the respective countries offer an opportunity for asset diversification given that these markets are often presumed not to be as interrelated between each other nor with the developed markets. Considering the ongoing globalization of equity markets, it is necessary to understand the specific features of return generating process in the CEEs and in Russia.

For the emerging markets it is intuitive to suppose that the presence of information asymmetry, the participation of inexperienced investors and a prevalence of small

capitalization stocks should breed anomalies in equity returns. Thus, possible presence of anomalies in stock returns is intriguing to both long-term investors and speculators. Furthermore, some studies have documented that seasonal abnormalities are declining, at least on several developed markets. Therefore, it is motivating to explore the persistence of the anomalies over time in the transition economies as well. Are irregularities prevalent in the early stages of the emerging stock markets and do they show signs of diminution along with ongoing integration with the developed markets. Hence, the reduction of seasonal patterns could be a sign of a trend toward more efficient capital markets.

To author's knowledge, there are no previously published studies found regarding permanence of calendar patterns in the transition economies. Additionally, existences of turn-of-the-month or Halloween effects have not been examined in these countries. For these reasons it is enlightening to assess the degree to which markets in these economies are informationally efficient and to document changes in the efficiency over time.

1.2 Research Questions

The purpose of this study is to investigate and empirically test seasonal irregularities in stock market of Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russia, Slovakia and Slovenia. The goals of this study are to find answers to the following questions:

1) Do commonly known calendar anomalies: day-of-the-week, month-of-the-year, turn-of-the-month and Halloween effects exist in the transition economies?

Ajayi et al. (2004) studied the Monday effect in eleven Eastern European Emerging Markets (EEEM) from 1994 to September 2002 and concluded that albeit both positive and negative Monday returns were found, only Russian positive Monday returns and Estonian as well as Lithuanian negative Monday returns were statistically significant. Moreover, Asteriou and Kovetsos (2006) investigated eight CEE transition economies

during the period of 1991 to May 2003 and found strong statistical evidence for the January effect in Hungary, Poland, Romania and Slovakia.

The time-period explored in this study (1997 to February 2008) is different from the one used by Ajayi et al. or Asteriou and Kovetsos because by now, ten out of twelve chosen countries with an exception of Croatia and Russia have accessed the European Union. As of May 2004, Baltic countries, Poland, the Czech Republic, Slovakia, Hungary and Slovenia became members of the EU, while the negotiations on membership started in 1998. Bulgaria and Romania joined the EU on 1.1.2007 (negotiations started in 2000) whereas Croatia is yet undergoing EU accession negotiations since October 2005.

The accession of EU has brought a lot of regulation amendments concerning capital markets, while some changes are still being implemented. These emerging stock exchanges have experienced major transformation including deregulation, the opening of the exchange membership to foreign-owned intermediaries, and switching to electronically executed trading. Furthermore, the stock exchanges studied in this paper have increased the number of trading hours to promote access. Market-making/block-trading has been introduced to increase liquidity, order handling and execution systems have been refined to increase efficiency, and information systems have been improved to enhance transparency. Thus, it is intuitive to presume that the market efficiency should augment during the investigation period. This leads to the second question:

2) Are calendar anomalies robust to different time-periods?

In order to investigate the persistency, the data is studied as a full period and three sub-periods. The time-periods are divided as in accordance with the EU acceding. The first sub-period explores 1997-2000, that could be considered as the negotiation period. Second sub-period (2001-2004) is regarded as the pre-accession period and the third sub-period (2005-February 2008) as the post-accession period. Nonetheless, it is also interesting to reflect how market efficiency has evolved in the Russian stock markets during these time-periods without imposed regulation by the EU.

With the intention of evaluating the obtained results against other stock markets, the MSCI European, World and Emerging Market indices are used as comparative benchmarks. This directs to the last question:

3) How do the findings differ from international evidence?

A lot of research has been carried out to explore calendar anomalies. The markets assessed are notably diverse in terms of size, liquidity, participation of foreign investors etc. These facts can affect the character and form of calendar patterns considerably. The goal of the study is to discover differences between the CEE and Russian stock markets and the international evidence.

Finally, study aims at providing some guidance to financial practitioners as whether these calendar anomalies should be considered in trading decisions. The existence of calendar irregularities implies that there is an ability to obtain abnormal returns by constructing trading strategies based on historical performance of the securities. The study intends to address this subject in association with the findings.

1.3 Structure of the Study

Thesis begins with a description of the stock exchanges and their development in the respective CEE countries and Russia. It is necessary to understand the specific conditions of these markets before attempting to explain, how and why possible calendar patterns might differ from the ones depicted internationally. Subsequently, Chapter 3 portrays the market efficiency theory introduced by Fama (1970). Three forms of market efficiency are also discussed in this chapter with the purpose of developing a basis for the theoretical perspectives of the anomalies. After that, Chapter 4 presents the day-of-the-week, month-of-the-year, turn-of-the-month and Halloween effects comprehensively and aims to find clarification for the existence of these patterns. Following Chapter 5, defines the data set employed in the study while the methodologies applied are presented in detail in Chapter 6. A variety of analyses are completed by exploiting the techniques illustrated in Chapter 6 and the study commences to present the outcomes of these analyses in

Chapter 7. Finally, Chapter 8 summarizes the main findings and provides ideas for future research.

2 Emerging Stock Exchanges in the CEE-Countries and in Russia

This chapter presents an overview on stock market evolvement in the sample countries in terms of development, market capitalization and liquidity. In addition, from the point of view of asset diversification and risk management it sheds light on the level of integration these countries have achieved with regional as well as more developed equity markets.

2.1 The Development of Stock Markets

Countries established stock exchanges at different points of the transition process. Slovenia, Croatia, Hungary, Bulgaria[1] and Poland opened their stock markets very early (1990-1991), and the Czech Republic, Slovakia and Lithuania followed in 1993. Trading on the Latvian, Russian and Romanian stock exchanges started in the mid 1995 while Estonia did not open up its stock exchange until spring 1996.

The emergence of stock markets has been interconnected with the privatization process since most of the listed companies have gone through privatization. In particular, countries in transition chose diverse strategies for privatizing state-owned enterprises. For instance, Hungary started privatization early and followed a case-by-case sales method, while the Czech Republic opted for a mass voucher privatization scheme. Poland was slow in employing mass privatization, but in the meantime a large number of individual firms were privatized through management buyouts and liquidation processes. (Berglöf and Pajuste, 2003)

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[1] In Bulgaria, during 1992-1994, there were about twenty regional stock exchanges, which merged by the end of 1995. The Bulgarian Stock Exchange remained the only operational stock exchange in the country.

Among the twelve countries included in the study, three approaches of privatization methods can be distinguished[2]. In Bulgaria, the Czech and Slovak Republics, Lithuania and Romania listing was compulsory after mass privatization. The stock exchanges in these countries are characterized by a preliminary rapid increase in the number of listed companies, and then a gradual and in some countries steeper decrease. In the early stages very few shares were actively traded and once the markets became more established, illiquid shares have been de-listed as a result of more rigorous regulation (e.g. minimum capital and liquidity requirements). The other group of countries – Croatia, Estonia, Hungary, Latvia and Slovenia – chose to start with a small number of listed shares, which was increased as the markets developed. The shares listed were usually voluntary initial public offerings. The third group of countries – Poland and Russia – combined both of the previous methods i.e. some voluntary offerings and some mandatory listing of minority packages of the privatized enterprises. (Claessens et al., 2000; Berglöf and Pajuste, 2003)

The size of stock markets plays a great role in perspective of equity market viability, independence and future development. The economies of scale are of vast importance in stock market activity and the costs of running a relatively small stock exchange may become too high (technology, trading systems, analysis, etc.). The recent local and cross-border merger trends of stock exchanges show that small, local stock exchanges are "eaten up" by the larger regional or foreign operators. For example, Estonian, Latvian and Lithuanian exchanges were acquired by the OMX Group during 2001-2004 and consequently are nowadays a part of the leading worldwide exchange operator – the NASDAQ OMX Group Inc. Accordingly, the Hungarian, Budapest Stock Exchange (BSE) experienced a major reorganization in the ownership structure throughout 2004, when strong Austrian banks, together with Wiener Börse and Österreichische Kontrollbank AG purchased a majority stake in the local exchange. As an example of a

[2] Claessens, Djankov and Klingebiel (2000) discuss in detail privatization methods used in relation to stock market development in the transition economies.

regional coalescence two Croatian exchanges, Zagreb and Varaždin Stock Exchanges, merged in March 2007 to form a unique Croatian capital market, the largest in the region.

Considering current trends, it is quite realistic to expect that the consolidation of the CEE equity markets will continue in future. Empirical evidence shows that as emerging economies improve their macroeconomic and financial fundamentals, there is an increasing migration of capital rising, listing, and trading activity to international exchanges (Claessens et al., 2002). Larger CEE companies prefer to list in the foreign exchanges and in this sense relatively small markets such as Bulgarian, Romanian, Slovakian and Slovenian exchanges might be forced to form alliances or to merge with the competitors. These consolidations would enhance fuller integration within Europe that could deepen these countries capital markets, diversify the investor base, attract trading liquidity, and lower costs through increased competition.

The institutional environment in the former socialist economies has improved tremendously over the last decade, and amendments are still being implemented. To considerable extent new laws regulating equity markets and other financial industry activities have been imposed from Europe as part of the EU accession process or copied from the UK or the US. All exchanges, with an exception of Russia, are full or corresponding members of Federation of European Securities Exchanges (FESE), meaning that they are obliged to follow the EU standards regarding the equity markets operations.

However, there are yet some domestic challenges with relation to ensuring the implementation and sustaining the enforcement of these laws before reaching western measures of effective capital markets. Berglöf and Pajuste (2005) show that despite existing regulation, corporate governance arrangements vary substantially across countries. Authors argue that in many CEE-countries shareholdings have become increasingly concentrated and consequently financial markets remain weak. The level of firms' disclosure diverges considerably across firms, and even though disclosure is dependable on legal framework and practice in a given country, it does not correlate with

firms' financial performance. In particular, information is more available in larger firms, firms with lower leverage, higher market-to-book ratios and more concentrated ownership. They suggest that there should be serious corporate governance reform measures taken to increase the efficiency of the CEE capital markets. These facts deteriorate transparency of companies' actions and investment willingness of domestic as well as international investors in terms of: insufficient shareholder protection, ownership and control issues producing acute agency problems and indistinctness of possibilities to solve possible disputes in the court systems. As a result, the future progress in respective equity markets is conditional to unraveling these matters.

2.2 Market Capitalization

The development of market capitalization reflects the chosen privatization method discussed above. In countries that followed more gradual privatization, equity market capitalization increased slowly (e.g. Poland and Hungary), while in countries with rapid mass privatization, market capitalization jumped to rather high levels and then decreased due to de-listing of illiquid shares (e.g. the Czech Republic). The downward sloping tendency in capitalization figures after 1999 (see Table 1) has several explanations.

Table 1: Stock Market Capitalization in billion USD

Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006e*
Bulgaria	0.07	0.02	0.00	0.94	0.75	0.60	0.50	0.66	1.58	2.56	5.36	9.82
Croatia	0.58	3.04	4.34	3.14	2.79	2.67	3.28	3.59	5.53	10.22	13.53	27.73
Czech Republic	15.77	18.11	13.99	11.20	12.27	10.71	8.72	14.60	16.08	27.52	39.83	44.87
Estonia	0.00	0.00	1.14	0.49	1.91	1.77	1.49	2.18	3.77	5.65	3.54	5.68
Hungary	2.59	5.60	16.10	14.06	17.48	12.04	9.97	11.41	15.45	25.54	34.88	38.19
Latvia	0.01	0.15	0.34	0.37	0.39	0.57	0.70	0.68	1.06	1.58	2.65	2.57
Lithuania	0.16	0.90	1.70	1.08	1.14	1.58	1.20	1.32	3.14	5.88	8.28	9.72
Poland	4.73	8.93	13.04	20.63	30.91	29.80	25.15	26.95	35.77	58.18	94.57	139.77
Romania	0.14	0.07	0.71	1.26	1.03	1.26	2.33	4.63	5.47	10.50	21.95	30.03
Russia	16.28	40.74	132.70	44.57	80.78	39.74	79.72	126.64	219.79	259.71	550.38	1020.53
Slovakia	0.00	2.27	1.89	1.00	1.08	1.28	1.56	1.67	2.47	3.99	4.51	4.92
Slovenia	0.00	1.43	2.41	3.74	3.25	2.63	2.78	4.95	9.10	14.94	12.65	23.97

* e are estimated figures

Source: EBRD, the author's calculations

According to Berglöf and Pajuste (2003), first of all, the overall stock market downturn in the world affected most transition markets adversely. Second, stricter listing requirements (e.g. the minimum capital requirement, information disclosure and transparency) strained

many companies to de-list. The low number of initial public offerings (IPOs) during the late 90's and the beginning of 21st century along with the many deliberate de-listings suggest that the costs of listing outweighed the benefits. Listed companies had to provide much more information on a standard basis than unlisted ones, and were subject to more rigorous supervision and scrutiny by the public. Third, ownership is becoming increasingly concentrated, and as most of the countries have introduced mandatory bid rules[3], owners passing a certain threshold must offer to buy the entire firm. As a result firms are obliged to leave the stock exchange, because one of the listing requirements is that a certain minimum of shares (e.g. 25 percent) has to be in public circulation.

By the end of 2000, stock market capitalization was the highest in Russia, followed by Poland, Hungary and the Czech Republic. The rest of stock markets in the region were yet negligible, partly due to the small size of the country (Estonia, Latvia, Lithuania, and Slovenia) or poor regulatory framework (Bulgaria, Romania and the Slovak Republic).

In line with Berglöf and Pajuste, the figures show that the CEE and Russian markets are not segmented from the worldwide economic instabilities. They are rather affected by economic downturns such as the Asian crisis in 1997, considerably more so by Russian default in 1998 as well as the worldwide market decline following the bust of the IT bubble in 2000-2001. These effects verify the growing interdependencies between world equity markets. Capital movements may subject a country to global shocks along with investors "herd mentality". For instance, Pajuste (2002) reviews that stock market returns in the Czech Republic, Hungary and Poland, are more explained by the general investment mood towards emerging markets. In case of a global crisis, foreign investors fail to differentiate between fundamentally better or worse emerging markets – the prevailing investment attitude is "grab your money and run". Thus, the countries with the strongest foreign investor presence are affected by the turbulence in other emerging markets worldwide.

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[3] A bid rule is an obligation to offer to buy back shares from minority shareholders once a certain threshold is passed.

Generally the investors are more sensitive to negative news than to positive news, perhaps a typical reaction for the emerging markets. Emerging markets are "by definition" described by higher risks, so investors might amplify the extent and importance of a negative event. For example, a change of government does not usually influence stock market returns in developed countries, but in emerging markets the same event has often more influence on stock prices. The government change may bring, first, a government crisis that would then be defined as a negative event, and stock market would react negatively because of alleged instability and uncertainty. Or, this may be a positive event if the previous government has been inefficient and the perception is that any replacement will improve the situation. (Pajuste, 2002)

However, fluctuations of international equity markets have until now had little long-term impact on real growth of the equity markets in the sample countries. Especially during the period from 2002 to 2006, the stock markets have prospered in the transition economies. In comparison with other states the Russian stock market capitalization stands out. During 2004-2006 it has almost quadrupled due to strong commodity prices and a domestic boom in recent years. Moreover, Russian private enterprises have extended their access to funding on the capital markets considerably. A number of listings in both foreign and Russian equity markets demonstrate that many Russian entities are adhering to higher corporate governance standards (Transition report, 2006).

In countries where the overall development of markets has been lagging behind, stock-markets have out-performed other components of the financial system in recent years. On the other hand, stock market capitalization does not necessarily represent a reliable indicator of its importance for enterprise financing, as much as capitalization in transition economies continues to reflect privatization operations. (Transition report, 2006)

In comparison to more mature equity markets the development of stock exchanges is still at an early stage in most of the CEEs. In eight out of twelve states stock market capitalization as percentages of GDP amounted to 35% or below (see Table 2) in contrast

to average of 82.8 percent in the euro zone in 2006 (IMF, 2008). Nevertheless, in some countries stock market capitalization has reached levels comparable with those of advanced economies, signaling an important link between growth of the banking sector and stock market development.

Table 2: Stock Market Capitalization as Percentages of GDP

Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006e*
Bulgaria	0.50	0.20	0.00	7.40	5.80	4.80	3.70	4.20	7.90	10.40	19.70	31.20
Croatia	3.10	15.30	21.60	14.50	14.00	14.50	16.50	15.60	18.70	28.70	34.80	64.60
Czech Republic	28.50	29.20	24.50	18.10	20.40	18.90	14.10	19.40	17.60	25.10	31.80	31.50
Estonia	na	na	23.10	8.90	34.20	31.50	24.10	29.90	39.30	48.50	25.30	34.60
Hungary	5.80	12.40	35.20	29.90	36.40	25.10	18.70	17.10	18.30	25.00	31.60	34.10
Latvia	0.20	2.70	5.50	5.50	5.40	7.30	8.40	7.30	9.50	11.50	16.50	12.80
Lithuania	2.50	11.20	17.30	9.70	10.50	13.80	9.90	9.30	16.90	26.20	31.80	32.60
Poland	3.40	5.70	8.30	12.00	18.40	17.40	13.20	13.60	16.50	23.00	31.10	41.00
Romania	0.40	0.20	2.00	3.00	2.90	3.40	5.80	10.10	9.20	13.90	22.20	24.60
Russia	5.20	10.40	32.80	16.90	41.20	15.30	26.00	36.70	51.10	44.60	71.90	104.40
Slovakia	na	10.90	8.90	4.50	5.30	6.30	7.40	6.80	7.50	9.50	9.50	8.90
Slovenia	na	7.70	14.30	20.50	17.50	17.00	17.00	24.50	28.90	36.30	28.00	49.90

* e are estimated figures

Source: EBRD, the author's calculations

So far, the financial sectors of transition economies are dominated even more strongly by the banking sector than those of euro area countries; banking sectors are large, well-capitalized and characterized by strong foreign involvement. According to the Transition report (2006), the number of financial instruments is so far lower than in the euro area, spreads in intermediation and capital markets are higher (pointing to lower efficiency, lower liquidity or other structural factors) and some capital market segments – such as liquid secondary long-term bond markets – are rather undeveloped, with an exception of few countries. These circumstances lead to a fact that companies tend to finance themselves predominantly with bank loans, closed recapitalizations and private placement of securities in stead of raising public equity. Finally, a considerable share of the corporate sector receives financing directly from abroad.

Despite the escalating significance of equity markets in these economies, the consequences of a future turmoil in stock markets are vague, as on one hand their importance remains limited but on the other hand their rapid growth demands caution. These sharp expansions in stock exchange indices have already commenced a debate on

potential overvaluation due to purchases by foreign investors' seeking for higher returns. A fall in equity prices could result in fleeing foreign and national investors, putting pressure on the exchange rates and causing liquidity problems.

2.3 Liquidity

In order to estimate stock market efficiency, the market turnover expressed as a share of market capitalization reflects the actual liquidity of the market in question. As we can see from Table 3, the highest and most rising market turnovers during 21st century are exhibited by the Czech Republic, Hungary, Poland and Russia. The results are not surprising, since these countries have attracted considerable volumes of foreign capital in addition to their comparatively superior level of industrial and financial development.

Table 3: Stock Market Trading Volume as Percentages of Market Capitalization

Country	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006e*
Bulgaria	na	na	na	na	na	9.20	12.90	13.90	16.30	22.80	35.20	19.80
Croatia	na	na	8.60	2.70	5.00	7.40	4.00	3.80	4.80	6.00	6.70	8.80
Czech Republic	na	50.00	46.00	38.00	37.00	60.00	34.00	37.00	52.00	79.00	118.60	75.60
Estonia	na	na	na	98.20	17.60	18.90	13.60	14.90	18.30	17.50	51.10	21.20
Hungary	na	42.00	41.60	73.40	113.90	95.80	90.70	44.40	46.50	57.60	78.00	87.50
Latvia	na	16.60	34.40	24.20	11.30	48.60	26.30	24.00	15.70	8.10	4.60	4.20
Lithuania	na	5.00	5.10	17.60	39.40	48.50	14.80	15.10	17.50	8.20	10.10	23.30
Poland	na	84.80	78.40	54.30	45.80	49.90	26.10	28.70	26.60	33.10	36.30	46.20
Romania	na	7.50	71.70	96.40	61.50	23.10	15.70	23.00	8.80	11.60	21.00	16.10
Russia	na	11.10	24.40	11.30	5.90	36.90	39.10	30.10	46.00	53.00	39.00	64.60
Slovakia	na	135.90	108.00	73.70	59.70	129.80	na	na	29.40	19.80	1.60	1.90
Slovenia	na	66.80	40.40	34.90	32.30	20.70	30.50	27.90	12.70	14.70	9.00	8.50

* e are estimated figures

Source: EBRD, the author's calculations

On the contrary, Croatian, Latvian, Slovakian and Slovenian market turnover figures are below 10 percent, reflecting reasonably petite market size, to some extent ownership concentration and consequently a low amount of free float. These ratios are eminently inferior in an international comparison. For instance, according to World Bank statistics (2006) market turnover in China amounted to 110%, 125% in Germany and 140% in the UK throughout 2005.

As stated previously, also liquidity figures reflect the chosen privatization system. Indeed, delistings were observed in many markets during the change of the millennium,

often in favor of listings abroad, and most stock markets were dominated by only a few big firms, allowing little room for investor diversification and the financing of medium-sized enterprises. Furthermore, even though investors from abroad are usually seen as key to enhance market liquidity, their dominance also implies that domestic markets are strongly exposed to global market sentiment. Large market fluctuations abroad had been felt immediately in domestic markets, often irrespective of the domestic situation.

Additionally, relatively low liquidity can be attributed to the fact that when evaluating the structure of institutional investors in transitions economies with that of the e.g. UK, comparatively immense importance of pension and mutual investment funds can be depicted in the developed economies. Pension funds are so far of only small significance in the transition economies mainly because they were established just during recent years. Despite the introduction of mandatory pension funds, the minor domestic capital markets have not yet benefited from the pension reform as much as hoped, primarily because investment opportunities are still limited given the small size of these capital markets. (Transition report, 2006). Furthermore, pension funds are allowed to invest anywhere in the EU according to the EU legislation. For instance in the Baltic states, where the miniature capital markets provide a limited number of investment opportunities and euro adoption is a medium-term objective, pension funds have gone the furthest in diversifying their portfolios internationally. In Estonia and Lithuania, the majority of assets are denominated in foreign currency, mainly in Euros. This is a positive strategy for risk diversification but not necessarily for development of the regional capital markets.

Moreover, there are obviously some country specific reasons explaining liquidity issues. For example the steep decline of turnover in Slovakia during 2004-2006 can be ascribed to political issues. The pace of privatization slowed during 2005 due to the anticipation of general elections held in June 2006. New government decided to halt the sale of the state firms and all sales that were suspended by the previous government were not completed. This decision angered those foreign investors who had submitted bids, especially those that had been previously approved. The suspension was likely to produce lost revenue of at least 3.5 per cent of GDP. (Transition report, 2006)

To conclude, there are several challenges to further development of the capital markets in the CEE-countries as well as in Russia. There is a need to deepen market liquidity, to strengthen institutions in order to ensure the enforcement of laws and regulations and to establish good corporate governance, disclosure and transparency. Likewise the broadening of the asset base of institutional investors and the fostering of alliances or mergers of stock exchanges is essential for the further development of financial markets in transition economies. As well as helping improve fiscal sustainability, ongoing pension reforms can also stipulate capital market development to promote greater market integrity, modern trading facilities and to encourage more robust regulation in the financial sector as a whole.

2.4 Integration of the CEE and Russian Stock Markets

The accession of the EU imposes several economic criteria that acceding and candidate countries must fulfill with an objective to obtain stronger trade integration and closer co-movements of business cycles between countries to diversify the idiosyncratic shocks. On the other hand, emerging markets, whose asset returns are dominated by country-specific factors, have had lower correlations with their mature counterparts and thus provided a natural hedge for developed market portfolios. Therefore, from asset diversification as well as risk management point of view, it is important to evaluate the current level of integration that the CEE and Russian capital markets have achieved. Following sections assess most resent studies on the equity markets integration of the sample countries.

According to a time-varying integration score analysis performed during 1993-2004 by Birg and Lucey (2006), the achieved level of integration vary from country to country. Sample countries can be broken down into distinctive groups according to their recent integration score performance: a) countries which are becoming increasingly integrated with both regional European and international equity markets (Estonia, Hungary, Czech Republic, Lithuania, Poland) and b) countries which have becoming increasingly integrated with the regional market, while growing segmented with the world market (Latvia, Slovakia, Slovenia). Such findings have strong implications for international

portfolio diversification since with greater equity market integration opportunities for profitable international diversification are reduced. Therefore, countries such as Latvia, Slovakia and Slovenia could provide diversification opportunities for an international investor, in that they are free of capital controls and are segmented from an international market to a certain degree, all of which imply lower risk and higher return from investing in the countries' portfolios. However, the diversification opportunities are constrained by small variety of blue chip firms and low quantity of free float in these states, as affirmed above. For Czech Republic, Hungary, and Poland integration results indicate the dominance of sophisticated international investors over the countries' equity markets.

Hanousek et al. (2008) studied the reaction of asset prices to macroeconomic announcements in Poland, the Czech Republic and Hungary from 2003 to 2006. Composite stock returns were computed based on five-minute intervals (ticks) and macroeconomic news were measured based on the deviations of the actual announcement values from their expectations. Overall, authors find that all these three new EU stock markets are subject to significant spillovers directly via the composite index returns from the EU, the US and neighboring markets; Budapest exhibits the strongest spillover effect, followed by Warsaw and Prague. The Czech and Hungarian markets are also subject to spillovers indirectly through the transmission of macroeconomic news. The impact of EU-wide announcements is evidenced more in the case of Hungary, while the Czech market is more impacted by the US news. The Polish market is marginally affected by EU news. Authors' results suggest that the impact of foreign macroeconomic announcements goes beyond the impact of the foreign stock markets on Central and Eastern European indices.

Co-integration analysis amongst Bulgaria, Croatia, and Romania during the five years period from 2000 to 2005 indicates that these stock markets do not share a common stochastic trend with European index nor with the S&P500 index, representing the US markets (Onay, 2006). Taking into consideration the relatively favorable development of the respective markets, these findings point out significant diversification opportunities for international investors within Bulgaria, Croatia and Romania not only in the short-

run, but also in the long run. Furthermore, the results also suggest that Bulgaria's and Romania's integration with the European Union stock markets is not complete despite the achievement of accession negotiations which bring these economies closer to each other.

Saleem (2007) estimates Russian integration of post crisis period and reports the linkage of Russian market as increased with the US and Asia, where he finds two way volatility spillovers. Russian policies still effect on the emerging Europe, although the link between Russia and emerging Europe has weakened after the crisis, as these markets are more linked with Europe than Russia. Interestingly the relationship with the EU after the crisis has not been as significant as it was before the crisis. Whereas, after the crisis period shows bidirectional connection with the US and Asia and unidirectional ties with emerging Europe. Surprisingly, no statistically significant relations were found between Russian equity market and the equity markets of European Union in post crisis sample. Lastly, highly significant but negative shocks and volatility spillovers were observed from Russia to all other markets during the crisis period, indicating clear evidences of crisis contagion (Saleem, 2007).

As a final point, we can note that generally the CEE countries and Russia are becoming more integrated within international capital markets in a sense that they do respond to, especially negative, market mood in the rest of Europe and the world. The rising correlations over time designate that cross-country diversification benefits are decreasing. Nevertheless, they are not likely to entirely disappear since for the overwhelming majority of listed firms, the domestic market will be most important. Local risk factors are likely to determine the majority of the relationship between risk and return in the CEEs, before and after EU membership. In particular, differences in political cultures, tax and legal systems, and socio-demographic developments are prone to persist for the foreseeable future despite harmonization.

3 Market Efficiency

Following chapter clarifies the theory of efficient capital markets. The Efficient Market Hypothesis (EMH) by Fama (1970) is presented at first. Secondly, three forms of market efficiency are discussed: weak-form, semi-strong form and strong form. In addition, the assumptions of the market conditions that are presumed to be holding under efficient market theories are reviewed.

3.1 Hypothesis

According to Fama (1970) in active market, including many well-informed and intelligent investors, securities will be appropriately priced and reflect all available information. If a market is efficient, no information or analysis can be expected to result in outperformance of an appropriate benchmark. The EMH is closely related to arbitrage free pricing theory, implying that it is impossible to get a risk-free return in excess of risk-free rate with zero cost. Thus, stock price movements should not follow any patterns or trends and the past price movements cannot be used to predict future price movements.

Formation of a specific trading rule and analyzing it with the historical return data is one of the ways to test the market efficiency. This kind of testing will specify whether profitable rates of return would have been produced in the past. Finding an appropriate benchmark is problematic while running this test. The benchmark is needed to determine if the excess returns generated by buying and selling strategies would exceed the transaction costs. If the transaction costs and the short-term capital gain taxes are high enough, the buying and selling strategies would be inefficient. This is often the evident explanation behind the reasoning why investors have not started to profit from calendar anomalies.

3.2 Forms of Market Efficiency

There are three forms of market efficiency, as described by Fama (1970). The weak form of efficiency encloses all past stock price information to current stock prices. The semi-

strong form considers that all publicly available information such as published financial data about the companies, government data regarding the economy earning estimates, disseminated by companies and security analysis etc., are reflected in the securities prices. The strongest form of efficiency comprises every part of available information including even the insider information like imminent corporate takeover plans and unexpected positive or negative future earning announcements.

Considering calendar anomalies, already the weakest form of market efficiency presumes that the market should price away the seasonality effects. It means that if any anomalous return opportunity exists it can be extracted from the historical data and used by rational investors to create profits. This process will move market prices back to the equilibrium.

In order for these three forms of market efficiency to hold, as illustrated by Fama (1970), there are essential assumptions of the market conditions that should be met. These assumptions for the EMH market conditions are:

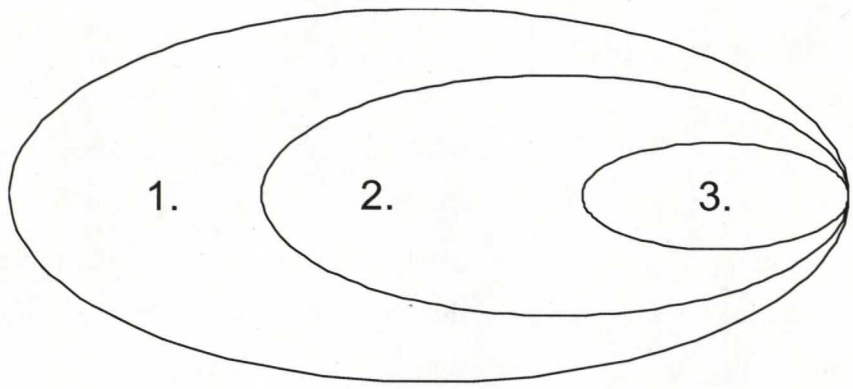
i. No transaction costs.
ii. All available information is costless and available to all market participants.
iii. All investors agree on the implications of current information on the current prices and the distributions of the future prices of each security.

If all these conditions were holding, the current price of a security would "fully reflect" all available information. Nonetheless, in practice, markets rarely fulfill the criteria listed above. Fortunately, these prerequisites are sufficient for the market efficiency, but not necessary. For instance, markets can be efficient if there are enough large amounts of investors having complete access to information. But if there are investors that can continuously outperform the market by having an exclusive admission to information, the markets are obviously inefficient. Similar approach is valid for the transaction costs and the agreement amongst investors regarding the implications of given information. To some extent, all these three conditions subsist in real world markets. However, the

objective of empirical work in this area is to measure their impact on price formation process. (Fama, 1970)

Figure 1 illustrates three forms of market efficiencies and the subsets of information for the EMH.

Figure 1: Subsets of Information for the Efficient Market Hypothesis



1. All available information
2. All public information
3. Historical stock price information

1. The largest circle represents the strongest form of efficiency asserting that all information is fully reflected in securities prices. In other words, even investor with unpublished insider information cannot obtain superior returns than others.
2. The second largest circle embodies the semi-strong form of efficiency affirming that all publicly available information is completely reflected in securities prices. It implicates that no investor can outbeat the market by using e.g. annual reports or company announcements. Thus, fundamental analysis is of no use.
3. The smallest circle represents the weak form of market efficiency that is delimited to historical security prices and data. It signifies that if stock prices tend to decline in December and rise in January, the investors should capitalize on the anomaly by acquiring stocks in December and selling them in January. This would lead to

disappearance of the calendar pattern and thus technical analysis should be useless.

In relation with the CEE and Russian stock markets, they are usually considered to at least fulfill the conditions of the weak form of market efficiency. Along with the undergoing development, deregulation and the increased transparency of these markets we could expect them eventually to satisfy the semi-strong form of the efficiency as well.

4 Calendar Anomalies

This thesis examines four different calendar anomalies: day-of-the-week, month-of-the-year, turn-of-the-month and Halloween effects. In addition to these, there is an ample of other empirical evidence that common stock returns exhibit seasonal patterns: holiday effect by Chong et al (2005), Friday-the-thirteenth effect by Agrawal and Tandon (1994), the more out of the ordinary lunar cycle effect by Yuan et al (2006) and so on. Interestingly, the most examined anomalies are not only observed in stock returns, but also in various financial markets such as money, derivatives and commodities markets. The existence of anomalies seems to be inconsistent with maintained theories of asset-pricing behavior indicating either market inefficiency i.e. profit opportunities or inadequacies in the underlying asset-pricing model.

There has been an ongoing debate about the significance and the persistence of the calendar effects. However, the literature has not fully achieved a consensus on this matter, mainly because the discovery of the calendar effects could be a result of data mining. Even if there are no calendar specific anomalies, an extensive search (mining) over a large number of possible calendar effects is likely to capitulate something that appears to be an "anomaly" by pure chance.[4] Another observation that points to data

[4] A popular phrase is that "the data has been tortured until it confessed". Lo and MacKinlay (1990) and Fama (1991) discuss on the subject of data mining, whereas Schwert (2002) examines the persistence of anomalies in stock returns, including the calendar specific anomalies.

mining as a reasonable justification is that theoretical explanations have only been suggested after the empirical "discovery" of the anomalies. Yet, the abundance of findings on systematic seasonal patterns in stock returns makes the subject intriguing to study.

In the following sections the day-of-the-week effect is described at first. Then the study continues with month-of-the-year, turn-of-the-month and Halloween effects. The presentation for subsequent sections is following: the seasonalities under investigation are introduced first and consequently the possible explanations for their existence are discussed.

4.1 Day-of-the-Week Effect

The day-of-the-week effect (DOW) is also known as the weekend or Monday effect. It indicates that the distribution of common stock returns is not identical for all days of the week. In addition, the selling and buying patterns in conjunction with trading volumes and variance are discovered to differ across the weekdays.

French (1980) has formulated two hypotheses on return distribution while trying to explain the DOW anomaly. *The calendar time hypothesis* implies that the returns are continuously generated during the week days. Mondays average returns are accrued also during Saturdays and Sundays, thus expected Monday returns are supposed to be three times higher than on other weekdays. On the other hand, *the trading time hypothesis* states that the expected stock returns should be equal on all weekdays, because they are generated during the transaction and thus represent one day's investment. The existence of the weekend effect is considered to be inconsistent with both of presented hypotheses.

Empirical studies conducted in the US and the UK markets show negative or significantly below average returns on Mondays and abnormally positive returns on Fridays. Yet, the negative Monday effect has been found much larger than the positive Friday effect. Cross (1973) and French (1980) provide the earliest evidence of the weekend pattern in the US stock markets. Additionally Wang et al. (1997) find that the Monday pattern occurs

primarily in the last two weeks of the month. Interestingly, the traditional weekend effect as described above seems to have reversed recently. Brusa et al. (2003) study several broad market indices in the US during the 1966-1996 period and document that the Monday return patterns differ between the pre and post 1988 sub periods. Monday returns are significantly positive and higher than the returns on other days of the week over an extended period of eleven years during 1988-1998. Authors also detect that both (traditional and reverse) weekend effects are observed in most industry indices besides the broad market indices and that the similarity is persistent after classifying data by month of the year and by week of the month. From these results they argue that the weekend patterns are driven by specific macroeconomic factors affecting all sectors of the economy rather than firm- or industry-specific features that impact only a few industries.

Substantiation from other major markets provides further support for existence of the DOW effect. Dubois and Louvet (1996) as well as Draper and Paudyal (2002) discover negative average Monday returns in the UK. Chang et al. (1993) find the same pattern in the German stock markets. However, there are also certain variations in the intra-week behavior of stock returns across countries. Dubois and Louvet (1996) find that in the US and the UK markets, negative returns on Monday are compensated by abnormal positive returns on Wednesday. Albeit, during the study period of 1969-1992, authors ascertain that Australia, Canada, Japan, Hong-Kong, France and Switzerland exhibit negatively low returns on Tuesdays. This is in line with the results obtained from several European equity markets[5].

Accordingly, Martikainen and Puttonen (1996) investigate the day-of-week phenomenon in the Finnish stock markets with the FOX index return series from 1989 to 1990. They

[5] For empirical evidence on negative Tuesday patterns see e.g. Spain by Santamases, 1986; France by Solnik and Bousquet, 1990; Ireland by Lucey, 1994 and Greece by Lyroudi et al. 2002.

document statistically significant negative returns on Tuesdays and Wednesdays.[6] Authors suggest that in thinner European markets individual investors' increased selling pressure during the weekend is reflected on stock markets with a lag on Tuesday because selling orders placed on Mondays are executed with a delay. This outcome can be also attributed to short-selling restrictions imposed on some European markets.

Weekend effect is not limited to the developed markets only. Resent studies show that the emerging markets exhibit mixed DOW patterns as well[7]. Ajayi et al. (2004) explore the Monday effect in eleven emerging Eastern European markets during the time period from 1994 to 2002. Their empirical results indicate negative Monday returns in six of the eleven countries and positive Monday returns in the remaining five. Yet, only two of the six negative Monday returns (Estonia and Lithuania) and only one of the five positive Monday returns (Russia) were statistically significant. Thus, researchers conclude that there is no consistent evidence to support the presence of daily patterns in the CEEs.

4.1.1 Reasons for the day-of-the-week effects

There are several hypotheses formed to explain the DOW patterns; the most recognized among them are the information release hypothesis, the information processing hypothesis and the settlement regime hypothesis. These are discussed subsequently.

The information release hypothesis

French (1980), Dyl and Maberly (1986) and De Fusco et al. (1993) argue that companies tend to delay in release of negative news until after the closure of stock exchange on Friday. Clustering of publicized negative information at weekends creates bearish

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[6] Martikainen and Puttonen also study the day-of-the-week patterns in the Finnish derivatives markets and find a strong negative Monday effect on both options and futures market.

[7] Choudry (2000) confirms the day-of-the-week effect in seven emerging Asian stock markets (India, Indonesia, Malaysia, Philippines, South Korea, Taiwan and Thailand). Yakob et al (2005) confirm seasonal patterns in Asia Pacific (China, Hong Kong and Japan) as well as Mlambo and Biekpe (2006) in African countries (Botswana, the BRVM, Egypt, Ghana, Mauritius, Morocco, Namibia, Tunisia and Zimbabwe).

environment in the stock markets on its reopening on Monday. Nevertheless, French acknowledges that this cannot be a sole reason for regular negative Mondays because investors would incorporate their expectations of bad news to stock prices during the week.

The information processing hypothesis

Miller (1988) as well as Lakonishok and Maberly (1990) state that the behavior of individual investors is responsible for the observed Monday-effect. Individuals tend to assembly information and plan their investment decisions during the weekend because throughout the week they are preoccupied with other activities. As a result the propensity to transact on Mondays is relatively high and additionally, individuals are more likely to sell rather than buy after the weekend. They may put some buying orders on other weekdays based also on their broker's recommendations. Though, Groth et al. (1979) observed that of 6000 brokers' suggestions 87% were purchase recommendations. Hence, for selling decisions the individual investors have to be based predominantly on their own information processing. On the other hand, professional and institutional investors decrease their number of trades on Mondays and use the beginning of the week to plan the asset allocation decisions that are executed later on (Lakonishok and Maberly, 1990). These variations in trading volumes lead to diminishing prices on Mondays whereas increased number of buy orders towards the end of the week raise equity prices and produce higher returns towards the end of the week. In this case, the day-of-the-week effect is related to the inelasticity of the demand.

The settlement regime hypothesis

Lakonishok and Levi (1982) attribute the effect to institutional features of the national stock markets such as the settlement procedures delays between trading and settlement in stocks. Solnik (1990) classifies settlement procedures into two categories; the fixed settlement-lag system and the fixed settlement date system. Under the fixed settlement-lag system, that may vary from country to country, the settlements takes place a fixed

number of business days after the transaction and causes returns to be not identically distributed over all days as in Martikainen and Puttonen (1996). Whereas under the calendar time hypothesis, fixed settlement date system is expected to produce typical day-of-the-week effect around the weekend (Lakonishok and Levi, 1982). For example, if the transactions are settled after few days (i.e. on T+1 or T+2 basis) Saturday and Sunday being the weekly holidays, the extra two days credit period will be provided for the transactions taken place on Friday. The interest cost for this credit period given is likely to push up the prices on Friday. Consequently daily returns will be higher on Fridays and lower on Mondays, when returns are measured on the basis of daily closing prices. This argument can be also extended for other holidays besides the weekly holidays.

Some other explanations for the day-of-the-week effect include bid-ask-spread biases (Keim and Staumbaugh, 1984), pricing misquotes and measurement errors (Gibbons and Hess, 1981), other reasons related to economic business cycles (Liano and Gup, 1989), and dividend patterns (Draper and Paudyal, 2002).

4.2 Month-of-the-Year Effect

The month-of-the-Year (MOY) effect implies that the return on common stock is not the same for all the months of the year. January effect or turn-of-the-year effect is one of the best known stock market anomalies discovered during the past decades. The international evidence portrays abnormally high returns on the majority of markets in January while significant negative returns to common stock occur in December. There are many explanations for the phenomenon while the most commonly known reasons for the persistence of the January effect are: tax-loss selling hypothesis, information hypothesis, turn-of-the-month liquidity hypothesis and window-dressing hypothesis.

Wachtel provides the earliest evidence on the anomalous January stock returns in 1942 for the US stock markets. Rozeff and Kinney (1976) conduct the first formal analysis on the phenomenon, and find that between 1904 and 1974 returns on an equally weighted index of NYSE stocks were much higher in January than in other months of the year. According to EMH, when a trading strategy is widely known to a public, there should be

no use of trading based on it, since the pattern should disappear after its discovery due to rational investor capitalization of the abnormal profit opportunity. However, empirical evidence indicates that the January effect still exists over 30 years after its discovery. This fact has made researchers to search for explanations why investors are not starting to benefit from this market anomaly.

Keim (1983) tested for the monthly effect in the US market, during the years 1963 to 1979. He concluded that there was evidence on the existence of a January effect, and more specifically half of the annual difference between the rates of return on small and large firms occurred in the month of January. This is in line with findings by Lakonishok and Smidt (1988), stating that January effect is not observed in an indicator composed of stocks of large firms. Therefore Keim (1983) argues that January effect should be examined along with the size effect. Size effect implies that the significantly larger volatility of small capitalization stocks causes more of them to experience substantial short-term capital losses that investors might want to realize for income tax purposes before the end of the year. This selling pressure might reduce prices of small stocks in December, leading to a rebound in early January as investors purchase these stocks to reestablish their investment positions. However, since the primary goal of this study is to illustrate four different calendar anomalies, examination of January effect along with adjustments for the size effect is beyond the scope of this thesis.

As mentioned previously, January effect is said to affect small cap more than mid or large cap equities. This historical trend, however, has been less pronounced in recent years. Dimson and Marsh (2000) report that many of the famous calendar anomalies, in the finance literature, are not robust in different time-periods. They also show that January effect does not exist in portfolio returns of practitioners who focus on small capitalization firms and suggest that markets have adjusted for the anomaly. Another reason why the January effect could be considered less important nowadays is that more people are using tax-sheltered retirement plans and therefore have no reason to sell at the end of the year for a tax loss.

As far as seasonality in emerging markets is concerned, Ho (1990) provide evidence that in Asia Pacific stock markets, six out of eight emerging markets exhibit significantly higher daily returns in January than in other months for the period from January 1987 to November 1987. These markets include Hong Kong, Korea, Malaysia, Philippines, Singapore and Taiwan. Asteriou and Kovetsos (2006) study eight CEE transition economies during the period of 1991 to 2003 and find strong statistical evidence for January effect in Hungary, Poland, Romania and Slovakia. The empirical examination also shows evidence in favor of the tax-loss selling hypothesis for the cases of Hungary and Romania.

On the other hand, there is also a reverse side to the January effect. Instead, June and May are shown to have higher returns in Jamaica (Ramcharran, 1997) and Johannesburg stock exchange (Coutts and Sheik, 2000), respectively. A July effect is found in Kuwait (Al-Saad and Moosa, 2005) and a pattern centered on Ramadan (the Muslim holy month) is found for Saudi Arabia by Seyyed et al. (2005), while in several Latin American markets (Cabello and Ortiz, 2004) both January and other effects are found.

Researches propose four main hypotheses for the existence of January effect: tax-loss selling hypothesis, information hypothesis, turn-of-the-month liquidity hypothesis and window-dressing hypothesis. The tax-loss selling hypothesis was briefly pointed out in the previous paragraphs, but it will be covered more thoroughly in next section. The second hypothesis suggests that smaller firms have less publicly available information than large firms. The turn-of-the-month liquidity hypothesis proposes that liquid profits are greater in December in comparison to the other months. Finally, the window-dressing hypothesis implies that large scale institutional manager portfolio modification at the end of the year produces January effect. In the following section, the above mentioned rationale is discussed in more detail.

4.2.1 Reasons for the January effect

The tax-loss selling hypothesis

This hypothesis was first suggested by Branch (1977). According to the vhypothesis, investors sell their common stock that have performed poorly in order to realize losses against capital gains, thus reducing tax liability. This creates a downward price pressure at the year end (December) on securities that have previously experienced negative return. Subsequently, at the beginning of the new tax year (January), this selling pressure is relieved and the affected securities earn excess return as their prices rebound. Furthermore, because small firms stock returns are more volatile than large firms returns, small-firm stocks are more likely to have generated usable tax losses and therefore be candidates for tax loss selling.

Evidence in support of this hypothesis is provided by Potebra and Weisbenner (2001), who study the US market during 1960s and 1980s. They focus on changes in tax laws and investigate the linkage between tax motivations and the stock return patterns over the turn-of-the-year. Authors depict that the difference between long-term and short-term capital loss write-offs is influential on the excessive stock return over the turn-of-the-year. Also Dai (2007) re-examine the tax-loss selling explanation of the January effect on the Norwegian equity returns over the 1984 to 1999 period. During this time Norwegian rules governing the taxation of dividend and capital gains changed substantially several times over the sample period. Study shows that the variation in the return anomaly around the turn-of-the-year was significantly influenced by changes in the tax law: when the length of the short-term holding period increased, the excessive stock returns went down; when the restrictions on loss write-offs were relaxed, the excessive returns went up. If investors are not concerned with receiving tax shields from realizing losses at the year-end, then changes in tax law should not affect their trading behavior around the turn-of-the-year. Yet, the findings show that investors do care about loss selling, and the return anomaly is at least partially driven by that.

Contradicting evidences to the tax-loss selling hypothesis are also abundant. Brown et al. (1983) in Australia and Kato and Schallheim (1985) in Japan report significant January effects, even though January is not the beginning of the tax year. Additionally, Ho (1990) found little supporting evidence for tax-loss selling hypothesis in Asian Pacific markets. Only in three out of nine countries the return of the first month of the tax-year was significantly higher than the return for all the other months. Also according to Fountas and Segredakis (2002) in 18 emerging stock markets during 1987-1995, there was considerable evidence for seasonal effects in varying months, regardless of tax-year timing.

One rationalization for the existence of a January effect in the countries without the December-end tax year is that foreign investors induce a January seasonal in those countries. If investors from countries with a December-end tax year have significant equity holdings in foreign countries then the January seasonal would be observed due to trading by those investors. This could be the case also in those CEE countries as well as in Russia, where international investor attendance is most prominent.

The information hypothesis

This hypothesis relies on variation in the quantity of available information for different firms that may result in diverse returns and levels of risk. According to Rozeff and Kinney (1976), the excess January returns are the effect of significant information releases that occur in the first few days of January. Barry and Brown (1985) report that relatively information-poor securities have more systematic risk than their information-rich counterparts. Small-capitalization stocks are often considered to be rather information-poor in comparison with information-rich large capitalization stocks. The reasoning behind this aspect is that small companies publish financial figures more sparsely and are not as intensively followed by media nor by financial analysts during the year and therefore, new information is released with the fiscal year closures. The surplus of news associated with year-end reporting increases the information richness of small

stocks by relatively much more than that of the already informationally affluent large stocks. Consequently, small stocks react more strongly to the increased news flow in January by generating larger returns than large stocks. Furthermore, Penman (1987) suggests that in a phase of a long-term economic growth the reported financial results often tend to surpass the moderate forecasts of analysts. This promotes reassessment of potential performance of companies and elevates equity prices in the beginning of the year in January.

Conversely, Reinganum and Gangopadhyay (1991) empirical findings were unable to corroborate the information hypothesis. They analyzed the US stock market data during 1963-1987 and concluded that predictions of the accounting-information hypothesis were violated in six out of the seven cases for small firms. Additionally, the average returns of all small firms were high in January, irrespective of their fiscal year-end month. Therefore, high January returns among small firms with December fiscal year-ends were attributed to a reflection of an economic factor influencing all small firms rather than a reflection of uncertainty about annual accounting performance.

The turn-of-the-month liquidity hypothesis

Turn-of-the-month hypothesis implies that liquid profits are the highest at the end of December. This hypothesis is often used to explain turn-of-the-month anomaly. However, it can also clarify the January effect since the liquid profits are assumed to be greatest at the end of December. Related to the size effect and the tax-loss selling hypothesis Brown et al. (1983) contemplate that January effect is associated with the market capitalization of small firms as discussed previously. In early January, individual investors tend to invest spare cash accrued from year-end bonuses, holiday gifts and tax-loss selling in December. These actions produce a higher demand for securities, give rise to prices and result as abnormally positive returns in January. This explanation is in line with Odgen (1990), who interpolates that individuals generally realize larger year-end profits than institutional investors, since small stocks tend to be held by individuals and large stocks proportionally more by institutional investors.

The window-dressing hypothesis

According to the window-dressing hypothesis, developed by Haugen and Lakonishok (1988), institutional managers are evaluated based on their performance and their investment philosophy. To improve their performance, the institutions buy volatile and profit making equities of distant locations, emerging markets and small cap stocks but sell them before the end of the year so that they do not show up in their year-end holdings. At the beginning of the following calendar year (in January), investment managers reverse the process by selling large and low risk stocks, while replacing them with small and risky securities that typically include many past losers. These patterns in demand cause stock price fluctuations and fortify the January effect.

4.3 Turn-of-the-Month Effect

The turn-of-the-month (TOM) effect indicates that average daily rate of returns on common stock, around the turn-of-the-month, is different to that of average rate of return on remaining days of the calendar month. More specifically, the returns are significantly higher during the last trading day of the month. While the identification of TOM period varies by study, the original research by Ariel (1987) defines the TOM period as the first eight trading days of the month plus the last trading day of the previous month. Ariel analyzes the CRSP index[8] for 19 years period during 1963-1981 and finds that the market's entire cumulative advance occurred during the first half of trading months, with the last half of trading months contributing nothing. Lakonishok and Smidt (1988) examine the period from 1897 to 1986 for Dow Jones Industrial Average (DJIA) and find that the effect is especially strong during four days period [-1 to + 3], beginning with the last day of the previous month.

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[8] Ariel applies the University of Chicago's Center for Research in Security Prices (CRSP) equally weighted and value weighted daily stock index returns in order to proxy the returns accruing to US "equites".

Martikainen, Puttonen and Ziemba (1994) investigated the permanence of the TOM effect in 24 stock markets and 12 different regional indices in the world using a sample period from January 1988 to January 1990. The results confirmed that TOM seasonality existed for most countries as well as regions. Though, in smaller stock markets such as Finland, Mexico, Australia and New Zealand the effect was not detected. Martikainen argued that besides the short sample period, the five-day [-1, 4] event window used in the study might have been too narrow. Later, Martikainen, Perttunen and Puttonen (1995) reinvestigated the TOM effect in the Finnish stock market with a longer sample period from May 1988 to October 1993 and a broader event window [-5, 5]. Authors reported that the TOM effect was found in Finnish stock markets as well as in the futures and index option markets.

Accordingly, Kunkel et al. (2003) examine 2153 months from 19 countries during 1988-2000. Authors find that 4-day TOM effect persists throughout the 1990s in at least 15 of 19 countries investigated. Furthermore, the results indicate that TOM period accounts for 87% of the monthly return on average, in stock markets of 15 countries, where the TOM pattern exists. In relation to the possible existence of the concerning anomaly in the transition economies, there are no previous academic studies found.

4.3.1 Reasons for the Turn-of-the-Month effect

There are three main hypotheses explaining the existence of a given anomaly. First of them is the *turn-of-the-month liquidity hypothesis*. As discussed previously, it connects the raised profitability of TOM period with increased individual investor demand for equities along with the payment of salaries during the turn-of-the-month. Lakonishok and Smidt (1988) also attribute the effect to seasonalities in cash flows of institutions. They argue that for major economic entities the turn of the month is a typical payment date for accrued wages, dividends as well as interest and principal payments. As a result, these entities prefer to invest the short-term investable funds in securities maturing at the end of the month.

Other hypothesis is based on institutional investor portfolio revision by the end of month and formation and realization of new investment ideas. Lakonishok and Smidt (1988) argue that institutions bunch their purchases at the end of the month because of the improvement this produces in funds' performances published in the specialized press, as these are normally calculated on the basis of end-of-the-month price. Perceptibly, this observation is related to the *window dressing hypothesis*.

Also *information release hypothesis* is used to explain this anomaly. Penman (1987) finds that from October 1971 through December 1982 the distribution of good and bad earnings news is not even within a month. Earnings reports published in the first two weeks of the month convey good news, affecting stock prices of reporting firms favorably on average. Whereas reports appearing during the second half of the month are more likely to carry bad news and consequently they are more prone to affect stock prices negatively. The analysis indicates that this phenomenon can be explained, in part at least, by firms' practice of releasing earnings reports early when they have good news and delaying reports when the news is bad. This information release pattern leads to rise in stock returns in the turn-of-the-month.

Recently, Nikkinen et al. (2007) provide an economically plausible explanation for turn-of-the-month and intramonth anomalies that are interrelated with the information release hypothesis. Authors suggested that these anomalies arise from clustered information, namely from important macroeconomic news announcements, which are released systematically at a certain point each month. They verify that both anomalies exist in SP100 returns from January 1995 to December 2003. However, once the effect of macroeconomic news announcements has been taken into account, these anomalies disappear. As a result, authors conclude that empirical evidence provides strong support for the macroeconomic news announcement hypothesis.

4.4 Halloween Effect

According to a popular market saying "Sell in May and Go Away"[9], returns should be higher in the November-April period than those in May-October period. Bouman and Jacobsen (2002) execute the first academic study on this calendar time anomaly and name it as Halloween effect since Halloween is annually celebrated in the US on October 31st. Authors examine 37 developed and emerging markets between the period of 1970 to 1998 with a conclusion that this "inherited wisdom" is true in 36 of the 37 markets studied. Their findings indicate also that the Sell in May effect is particularly strong in European countries and robust over time. Bouman and Jacobsen suggest that the most likely cause of this anomaly may be the extent and timing of vacations. This makes sense, since money spent on a vacation is not put into the stock market, and people on vacation are generally not active stock market buyers during that time. Furthermore, authors propose a trading strategy to exploit this anomaly by investing in a value weighted index like the S&P 500 during the November-April periods and in a risk-free investment similar to the US treasury bills during the May-October periods. They find that this strategy presents significant market timing potential since it offers superior profits to buy-an-hold strategy throughout the whole year.

There has been an ongoing discussion in academic literature regarding the subject. Sullivan et al. (2001) dismissed the statistical significance of this or any other calendar-based trading rule, attributing the reported results to a large data mining exercise of the academic and financial communities. Nevertheless, Lucey and Whelan (2002) provided out-of-the-sample test on the Halloween strategy with the Irish CSO price index from January 1934 to December 2000. The empirical results indicated that the rule is economically significant and marginally so after adjustments for trading costs. Since

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[9] Some illustrative quotes; "The Stock exchange world is in a sort of twilight state at the moment. The potential buyers seem to have sold in May and gone away…" (Financial Times, 5/30/64, p.2). "Sell in May and go away, says the old adage", (The Economist, 7/11/92, Vol. 324 Issue 7767, p.71). "There's an old axiom about the market: Sell in May and go away", (Forbes, 5/20/96, Vol. 157 Issue 10, p.310).

1970, the November-April return averaged to 11.8 percent over the last thirty years against the average of -0.8 percent in May-October. By using a number of tests, authors find that the price formation process does indeed have seasonal features and reject the allegation that such findings could be attributed to data mining. Moreover, because Lucey and Whelan (2002) detected abnormally high returns frequently for January and April as well as occasionally for February and other months, they argue that perhaps other calendar month anomalies are better and parsimoniously ascribed to the half-year effect documented by Bouman and Jacobsen.

Yet, Maberly and Pierce (2004) re-examined the evidence provided by Bouman and Jacobsen for the US equity prices. They concluded that after adjustments for outliers, in particular the large monthly declines in October 1987 and August 1998, associated with the stock market crash and the collapse of the Long-Term Capital Management hedge fund respectively (causing the fall of the US stocks on average by over 15 percent), the Halloween effect disappears. However, they find that in bear market years there exists subjective evidence that most of the negative decline in equity prices occurs during the May-October periods.

Apart from the previous findings, Hong and Yu (2006) conducted a research of stock markets in 51 countries with a varying time period from 1962 to 2004. They found that in the Northern Hemisphere countries asset prices, share turnover and mean returns are significantly lower during the summer (July through September) than for the rest of the year due to vacations and lessened investing activity. These results could support the possible existence of anomalous November-April returns.

5 Data

The data investigated in this study consists of daily closing prices for stock market price level indices of eleven Central and Eastern European countries and Russia from January 1, 1997 to February 29, 2008. This is also the full sample period covered in the analyses.

The first sub-period assesses data from 1.1.1997 to 12.31.2000, second sub-period from 1.1.2001 to 12.31.2004 and finally the third sub-period from 1.1.2005 to 2.29.2008.

Each of the twelve exchanges has at least one major market index that reflects general price movements of securities over time and has a well-defined methodology for computing the index. I acknowledge the fact that the Total Return Index (TRI), capturing also the reinvested dividends, would offer a better understanding of profit generation in stock markets. Though, TRI was not available for all selected countries or it was only accessible for a very limited time period. Thus to maintain comparability and to obtain the adequate time-series, general price indices are used in this study.

For each specific market the study applies local benchmark indices instead of indices composed by international institutions e.g. International Financial Corporation (IFC). The latter may suffer from survivorship bias, since they commonly comprise of best performing companies stocks, while local benchmark indices include more stocks and thus represent a larger share of market capitalization (Pajuste, 2002). However, for the Baltic countries, Estonia, Latvia and Lithuania the OMX price indices were accessible only after 2000. Thus, HSBC indices are used for the aforesaid states. Furthermore, to evaluate the obtained results against other stock markets, MSCI price indices are used as comparative benchmarks for European, World and Emerging Markets[10].

The whole data is assembled from DataStream and the price indices are quoted in respective domestic currencies while the MSCI and Russian RTS indices are nominated in the US dollars. Academic literature shows mixed results when adjusting for a common numeraire. Alford and Guffrey (1996) find that seasonal patterns in four countries (out of 14 that demonstrate the pattern in local currency) are extinguished while in one country

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[10] The Morgan Stanley Capital International (MSCI) Emerging Markets Index contains companies from the following countries (largest capitalization markets in **bold**): Argentina, **Brazil**, Chile, **China**, Colombia, Czech Republic, Egypt, Hungary, **India**, Indonesia, Israel, Jordan, **Korea**, Malaysia, **Mexico**, Morocco, Pakistan, Peru, Philippines, Poland, **Russia**, **South Africa**, **Taiwan**, Thailand and Turkey. The precise weights of the respective countries in the index are not available.

seasonality is revealed after adjustment for exchange rates. Conversely, Ko (1998), discover that the effect of exchange rates on the monthly seasonality in 19 countries is not strong enough to influence the results. Given the inconstant evidence of the previous studies, I do not adjust for the exchange rates in the thesis.

The summary statistics of daily returns of twelve countries under examination are reported in Table 4. The number of daily returns ranges from 1920 for Bulgaria to 2913 for the majority of other states included in the study. The mean daily returns are positive for all countries and vary from 0.03 % in Slovakia to 0.14% in Bulgaria. The minimum and maximum return values are mostly found in the starting periods of the respective stock exchanges, reflecting the turbulent transformation from communism towards market economy and the challenging privatization of previously state-owned companies. Visual inspection of daily return curves reveals that volatility has been highest during the starting period of Eastern European stock markets and has more or less stabilized gradually with further evolvement of these economies. The standard deviation of the daily returns ranged from 0.99% for Slovenia to 2.63% for Russia. Examination of the data also reveals excess kurtosis in the returns of all countries and a negative skewness in the returns of all other countries except Croatia. Thus, heavy tails are commonly found in the daily return distributions.

Table 4: Descriptive Statistics on Daily Returns on each Index

Descriptive statistics are for daily returns during the whole sample period. Table shows number of observations (N), mean and median returns as percentages, standard deviation, maximum and minimum returns as percentages, skewness and kurtosis. Autocorrelation is tested by Durbin Watson test and heteroscedasticity of the residuals with White's test.

Country	Index	Starting date	N	Mean return (%)	Median return (%)	Std. Dev. (%)	Min return (%)	Max return (%)	Skewness	Kurtosis	DW statistics	White's test Chi square	White's test p-value
Bulgaria	SOFIX	10.23.2000	1920	0.14	0.04	1.79	-20.90	21.07	-0.44	35.54	2.13	1.37	0.849
Croatia	CROBEX	1.2.1997	2911	0.06	0.00	1.69	-13.38	17.47	0.09	14.53	1.99	6.29	0.178
Czech Republic	PX	1.1.1997	2913	0.04	0.02	1.25	-7.08	8.08	-0.21	2.89	1.85	6.36	0.159
Estonia	HSBC	1.1.1997	2913	0.06	0.03	2.05	-23.23	14.74	-1.24	24.30	1.70	7.02	0.135
Hungary	BUX	1.1.1997	2913	0.06	0.03	1.75	-18.03	13.62	-0.90	13.07	1.94	3.22	0.522
Latvia	HSBC	1.1.1998	2652	0.03	0.02	1.98	-15.11	27.03	0.29	20.99	1.73	4.56	0.336
Lithuania	HSBC	1.1.1998	2652	0.04	0.00	1.49	-14.23	11.41	0.03	7.61	1.82	5	0.287
Poland	WIG	1.1.1997	2913	0.04	0.01	1.47	-10.29	7.89	-0.34	3.99	1.83	2.96	0.564
Romania	BET	9.19.1997	2725	0.07	0.00	1.70	-11.90	11.54	-0.04	6.29	1.52	0.91	0.924
Russia	RTS	1.1.1997	2913	0.08	0.08	2.63	-21.10	15.56	-0.53	7.05	1.77	7.04	0.129
Slovakia	SAX	1.1.1997	2913	0.03	0.00	1.28	-11.48	9.57	-0.45	7.87	2.03	0.15	0.997
Slovenia	SBI	1.1.1997	2913	0.07	0.02	0.99	-11.34	11.02	-0.23	24.12	1.57	4.84	0.305
MSCI Europe		1.1.1997	2913	0.03	0.07	1.15	-7.00	6.42	-0.27	2.62	1.95	5.68	0.224
MSCI World		1.1.1997	2913	0.02	0.06	0.88	-4.52	4.60	-0.18	2.19	1.68	4.1	0.392
MSCI Emerging Markets		1.1.1997	2913	0.02	0.11	1.12	-7.43	4.65	-0.75	3.37	1.48	7.9	0.101

The lognormal data is tested for normality using the Kolmigorov-Smirnov test that compares the observed cumulative return distribution of the raw data to a hypothesized cumulative distribution. The normal distribution assumption is rejected at the 1% level for all 12 countries. Also visual inspection of the histograms supports the conclusion of non-normal distributions. Furthermore, the daily returns are tested for serial autocorrelation with Durbin Watson test. According to statistics shown in Table 4, no first order autocorrelation is detected. The White's test is employed to examine the heteroscedasticity of the residuals. There are no signs of the residual heteroscedasticity. Thus, the assumptions for classical linear regression model are met and the analyses are conducted using the Ordinary Least Square (OLS) model.

6 Study

6.1 Objectives

The first objective of the study is to find out whether the four calendar anomalies described earlier exist in the CEE-countries and Russia. There is large amount of research conducted to test the subsistence of calendar patterns in the emerging economies. However, transition economies have not received as much of attention on this matter.

Moreover, to author's knowledge there is now previous research carried out to explore the turn-of-the-month or Halloween effects in these economies.

The second apparent goal is to determine whether the anomalies are persistent over time or are they becoming less pronounced, indicating an increase in market efficiency. Additionally the study aims to find how the calendar patterns vary across countries and what kind of implications the findings may have from investors' point of view.

6.2 Methodology

The following econometric models are used to examine seasonal anomalies hypothesis. The daily continuously compounded stock returns are calculated as follows:

$$R_t = ln\ (P_t / P_{t-1})*100 \qquad (1)$$

where R_t is the daily percentage return of stock index, and P_t and P_{t-1} are the closing values on day t and $t-1$ for the same index.

Monthly stock returns are calculated as follows:

$$R_t = ln\ (P_{last}/P_{first})*100 \qquad (2)$$

where R_t is the monthly logarithmic return on stock index, and P_{last} is the closing value of index on the last day of the month and P_{first} is the closing value on the first day of the month for the same index.

6.2.1 Day-of-the-week Effect

To examine whether daily seasonal effects exist in the sample countries, the following regression is estimated:

$$R_t = \alpha_1 D_{1t} + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t \quad (3)$$

where R_t is the daily return of the index as defined earlier, D_1 through D_5 are the daily dummy variables and e_t is a random error term. If t is Monday, then $D_1 = 1$ and $D_1 = 0$ for all other days, and so forth. The null hypothesis is that the dummy coefficients are equal. Based on the results obtained from the Equation (3), the statistically significant DOW patterns are tested explicitly with the following regression:

$$R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t \quad (4)$$

where the intercept indicates the average returns for the day under examination. For example if the regression (3) indicates that Monday returns are significantly negative as in previously assessed academic literature, then the effect is tested with Equation (4). In this case the intercept, c, represents the mean return for Monday and the coefficient α_i, $i = 2,\ldots, 5$, indicates the difference in returns between Monday and the ith day of the week. The null hypothesis tested here is that all dummy variables are equal or close to zero. In addition, the F-value should not be statistically significant[11]. In order to reject the null hypothesis, coefficients α_i, $i = 2,\ldots, 5$, must be statistically different from zero and furthermore, the F-value has to be statistically significant. For instance, evidence of positive values of dummy coefficients along with significant F-value would be consistent with the negative Monday effect.

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[11] F-test is used for testing multiple hypotheses.

6.2.2 Month-of-the-Year Effect

To test for the monthly seasonal effects, I run the regression for the following equation:

$$R_t = \alpha_1 D_{1t} + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \ldots + \alpha_{12} D_{12t} + e_t \quad (5)$$

where R_t stands for the monthly return on index as defined previously, D_1 through D_{12} are monthly dummy variables and e_t is a random error term. If t is January, then $D_1 = 1$ and $D_1 = 0$ for all other months, and so forth. The null hypothesis to be tested is that α_i coefficients are equal.

As above, to test explicitly for e.g. January effects, the following regression is estimated:

$$R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \ldots + \alpha_{12} D_{12t} + e_t \quad (6)$$

where the intercept indicates the average return for January and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between January and the ith month of the year. The null hypothesis to be tested here is that all dummy variables coefficients are equal or close to zero and the F-value should not be statistically significant, as previously. The estimation of the coefficients in the Equation (6) will specify which months have lower average returns than the ones obtained in e.g. January.

6.2.3 Turn-of-the-Month Effect

Before introducing the methods applied to test the TOM effect, the event itself is distincted. The turn-of-the-month is defined as zero and consequently, the last trading day is defined as (-1) while the first trading day of the following month as (1). The days in the rest of the month are classified in the similar way. I examine the 16 trading days around the TOM to determine if any of the mean daily returns are significantly different from zero. The 16-day period includes most of the trading days in any month and is alike to one employed by Lakonishok and Smidt (1988), Kunkel et al. (2003), and others. Any

days that do not fall in the intervals [-8, -1] and [+1, +8] are disregarded. To examine the daily mean returns, following regression is estimated:

$$R_t = \beta_{-8} D_{-8,t} + \beta_{-7} D_{-7,t} + \ldots + \beta_7 D_{7t} + \beta_8 D_{8,t} + e_t \quad (7)$$

where R_t is the return on day t, $D_{i,t}$ are dummy variables for the first and last eight trading days of each month, where D_{-8t} corresponds to trading day -8, $D_{-7,t}$ corresponds to trading day -7, continuing through $D_{8,t}$, which corresponds to trading day + 8. The coefficients on the dummy variables, β_{-8} to β_8, are the mean returns for the 16 trading days and e_t is the error term.

According to previous studies most significant positive returns cluster around the TOM period and specifically during the trading days -1 trough +3. However, based on the evaluation of the results obtained from regression (7), I decided to apply the event window of [-1, 4] as in Martikainen et al. (1994). To test for the TOM effect directly TOM returns are compared to the rest-of-the-month (ROM) returns with the following regression:

$$R_t = \alpha + \beta D_{\text{TOM}} + e_t \quad (8)$$

where R_t is the return on day t, α is the intercept representing the mean return for the ROM period, D_{TOM} is a dummy variable for the TOM period, the coefficient β represents the difference between the mean TOM return and the mean ROM return and e_t is the error term. The null hypothesis tested in Equation (8) is that $\alpha = \beta$. If the coefficient β is positive in comparison to intercept and statistically significant then the null hypothesis is rejected and the results imply existence of the turn-of-the-month effect. Accordingly with previous analyses, final conclusion whether to reject the null hypothesis is based on the F-test.

6.2.4 Halloween Effect

Sell in May effect is analyzed as in Bouman and Jacobsen (2002) with following regression:

$$R_t = c + \alpha_1 D_t c + e_t \quad (9)$$

where R_t is the monthly index return, D_t is a dummy variable and e_t is a random error term. D_t takes the value of 1 if month t falls within the November-April period and 0 otherwise. The intercept term c represents the monthly mean return over the May-October periods and $c + \alpha_1$ represent the monthly mean return over the November-April periods. If α_1 is positive and significant at a meaningful level, then this is considered as evidence of a Sell in May effect.

However, since previous studies suggest that January-effect generates high positive returns in many stock markets, the significant α_1 coefficient in Equation (9) might be driven by the January-effect in disguise. To test this possibility Equation (9) is modified to include the January dummy. This is represented as:

$$R_t = c + \alpha_1 D_t + \alpha_2 J_t + e_t \quad (10)$$

Now, Sell in May dummy D_t has the value of 1 in the period November-April, except in January. J_t is set equal to 1 whenever month $_t$ is January and 0 otherwise.

Furthermore, to evaluate the economic significance of the Halloween strategy I compare annual returns of this strategy with a Buy and Hold strategy:

1. *Halloween strategy*: Investor who would like to profit from a Sell in May effect buys a market portfolio at the beginning of November and sells the portfolio at the

end of April. This investor will then invest in a risk-free asset (short-term treasury bonds)[12] from the beginning of May through the end of October.

2. *Buy and Hold strategy*: this strategy holds the stock market portfolio throughout.

To test whether I am able to reject the mean variance efficiency of the indices I use following regression:

$$R_{pt} - R_{ft} = \alpha + \beta(R_{mt} - R_{ft}) + e_t \qquad (11)$$

in which R_{pt} denotes the return in year t on the Halloween strategy in each country, R_{ft} is the risk free rate in year t, R_{mt} stands for the return on index in every country and e_t is a random error term . The null hypothesis is that α (Jensen's alpha describing how much the annual return of the strategy has exceeded the return of a corresponding index portfolio) is zero.

7 Empirical results

The following paragraphs of the study will go through the findings of empirical analyses carried out to test the day-of-the-week, month-of-the-year, turn-of-the-month and Halloween effects. First the results based on the whole sample period are covered and consequently all sub-periods are investigated. Each subsection concludes with reasoning for the findings. For reader's convenience, tables containing the results of conducted analyses are mostly placed in Appendices that are numbered accordingly with subsections.

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[12] I use annualized short term interest rates (interbank or treasury bill rates) taken from the EBRD. For Estonia and Romania I use deposit rates. For MSCI indices 3-month EURIBOR rates are employed, obtained from the ECB.

7.1 Day-of-the-week Effect

Whole sample period 1997-February 2008

Table 6 in Annex 1 illustrates the return statistics of the regression analysis based on the daily data for the full sample period. The estimated model is Equation (3), which enables to examine what kind of daily patterns the particular stock market indices might exhibit. The results suggest presence of DOW effects in ten states and in the MSCI Emerging Market benchmark index. In line with international studies (e.g. Lakonishok and Maberly, 1990) positive Friday is the most outstanding phenomenon, since it is significantly different from zero in Bulgaria, Poland, Romania, Russia, Slovakia and Slovenia at least on 5% level. In aforesaid countries, Friday returns are also highest during the week. There are indications of negative mean returns on Mondays in five countries, none of which are significant. On the contrary, in Hungary, Monday seem to outperform other days at 5% risk level. There are also other DOW patterns. Thursday is positive in Lithuania and in Slovenia at 5% and 0.1% level respectively at the same time as Wednesday is positive in Bulgaria, Estonia and Slovenia. There are no significant negative mean returns with an exception of Slovenia, exhibiting -0.1% plunge at 5 percent level on Tuesdays, whereas in Croatia, Tuesday generates loftiest yield of the week, but only at 10% level. Peculiarly, in Slovenia all other days except Monday are significantly different from zero whilst every other countries show mostly one DOW pattern. This is confirmed by extremely high 0.01% p-value for F-statistic in Slovenia.

Nonetheless, for any day-of-the-week effect to be a true stock market anomaly, the returns must not only be significantly different from zero, but they must deviate significantly from the returns during the rest of the week. Therefore, I apply Equation (4) that explicitly estimates these differentials. Table 7 in Annex 1, summarizes the obtained outcomes. When the F-test is used for testing multiple hypotheses, the results indicate that the DOW effect exists only in Lithuania, Russia and Slovenia. The former show evidence of abnormally high Thursday (0.16%) yields at 10% level. Russia exhibit abnormally positive Friday (0.29%) which is significantly different from zero at 1%

level. Furthermore, the F-test points out that there is divergence between Wednesday and Friday proceeds at 10% risk level, Wednesday being the only negative weekday. The analyses for the latter designate that indeed there are meaningful differences between days of the week (at the 0.1 percent level); Tuesday yielding -0.10%, Wednesday 0.10%, Thursday 0.17% and Friday 0.18%.

These abnormal patters present evidence in favor of *information processing hypothesis* reviewed in section 4.1.1. Individual and institutional investors' tend to perform asset allocation strategic planning and portfolio evaluation throughout the weekend and the beginning of the week. The execution of buying orders occurs during the second part of the week and thereupon trading volumes diverge across the weekdays. As a result equity prices rise towards the end of the week and consequently also produce higher returns.

First Sub-period 1997-2000

As can be seen from Table 8, only 6 countries show evidence of DOW patterns in addition to all MSCI indices for the first sub-period. Now there are several significant negative mean returns which can be associated with turbulence in these markets due to Russian default. Tuesday is once again the worst weekday for Slovenia (at 0.1% level), Wednesday for Slovakia (at 10% level) and Thursday for Hungary, Latvia as well as MSCI Emerging Markets index at least on 10% level. Positive days of the week are Wednesdays for Estonia in addition to MSCI Europe and World indices, while Thursdays are positive for Bulgaria at 10% level respectively. In Slovenia, the proceeds yet again seem to cluster towards the last three days of the week.

The closer examination of these patterns in Table 9 reveals that the null hypothesis can be rejected merely in case of Hungary and Slovenia. Hungary exhibits rather week evidence (at 10% level) on Thursday (-0.31%) returns being somewhat different from the rest of the week. While in Slovenia F-test proves that Tuesday (-0.2%), Wednesday (0.14%), Thursday (0.14%) and Friday (0.17%) proceeds differ significantly at 0.1% risk level.

Second Sub-period 2001-2004

During the preliminary examination this period is characterized as the most inclined to the DOW patterns. Table 10 demonstrates that all states with an exception of Croatia show signs of some irregularities. High Thursday yield is predominant in nine countries and in MSCI Europe index. Mondays are positive in Russia and Slovenia; Tuesdays in Bulgaria and Estonia whereas Fridays in Slovakia and Slovenia at least on 10 % level respectively. Wednesday's returns are lofty and significantly different from zero in Bulgaria and Estonia; at the same time as in Russia they are negative. Romania shows significant positive profits on every other weekday apart from Wednesday which can be attributed to the fact that during this period market capitalization of Romanian stock exchange has doubled annually. Overall, economic growth in the CEEs and in Russia throughout this time-period has potentially caused this abundance of positive DOW patterns.

However, Table 11 shows that surprisingly only in Russia Monday (0.38%), Wednesday (-0.23%) and Thursday (0.28%) returns diverge significantly at 5% risk level. These findings are in accordance with Ajayi et al. (2004), who report that Monday returns for Russia are higher than during the rest of the week.

Third Sub-period 2005- February 2008

Generally, the last sub-period is best described by larger yield on Thursdays in Croatia, Latvia, Russia and Slovenia as well as on Fridays in six countries. Abovementioned weekdays are also positive and significant for the MSCI Emerging Market index, as shown in Table 12. In Croatia, Tuesdays produce high profits and in Bulgaria also Wednesday returns are substantial. In addition, there is an indication of negative Monday effect in Estonia at 5% level.

What comes to testing multiple hypotheses, Table 13 shows that weekday patterns are significant in Bulgaria, Estonia, Lithuania and Slovenia. Bulgaria exhibits superior returns that are different from the other days of the week on Wednesday (0.17%) and

Friday (0.27%), at 5% risk level. For Estonia the F-test indicates that Monday (-0.19%) losses are meaningful in comparison to e.g. Thursday and Friday, yet the evidence is rather weak on 10% risk level. In Lithuania, Friday (0.29%) yields are largest on 5% significance level. Once again the null hypothesis of equally distributed mean returns is rejected for Slovenia at 0.1% level, given that Thursdays (0.25%) and Fridays (0.21%) are superior in comparison with other weekdays.

To summarize, the DOW patterns that would qualify as stock market irregularities are presented subsequently:

1. 1997 to February 2008: Lithuania (positive Thursdays*), Russia (positive Fridays*) and Slovenia (negative Tuesdays as well as positive Wednesdays, Thursdays and Fridays***).
2. 1997 to 2000: Hungary (negative Thursdays*) and Slovenia (negative Tuesdays as well as positive Wednesdays, Thursdays and Fridays***).
3. 2001 to 2004: Russia (negative Wednesdays and positive Thursdays**).
4. 2005 to February 2008: Bulgaria (positive Wednesdays*), Estonia (negative Mondays*), Lithuania (positive Fridays**) and Slovenia (positive Thursdays and Fridays***)[13].

Generally, in line with previously conducted international studies and *information processing hypothesis*, negative returns appear in the aforementioned countries during the beginning of the week (Monday and Tuesday) while positive yields cluster to the end of the week (Thursday and Friday). The *settlement regime hypothesis* could provide an additional explanation for the observed patterns. The transactions are settled after few days in the sample countries (i.e. T+1, T+2 or T+3, depending on the country). Therefore, the individual investors' selling pressure during the weekend and the acquisition orders placed in the beginning of the week are reflected on stock markets with a lag. For

[13] Notes: ***, ** and * indicate statistical significance for multiple hypotheses F-test at the 1%, 5% and 10% level respectively.

instance, buying order placed on Tuesday is executed during Thursday or Friday, which therefore pushes up the prices of securities towards the weekend.

The results show that Slovenia is most inclined to violating the weak form of EMH. For that reason weekday returns, to some extent, could be predicted on the basis of past performance. Though, it seems that after 2001 the DOW effect has declined. There is no evidence of significant weekday patterns in the second sub-period and during the third sub-period patterns have decreased from four significant days (in the first sub-period) to two abnormally positive weekdays. At first hand, this fact could be attributed to accession of the EU in 2004 and gradually increasing stock market efficiency along with improvements in regulation. However, the trading volumes have been constantly declining since 2001 as shown in Table 3. Hence, the diminution of the DOW patterns in Slovenia is rather caused by decreased trading.

Nevertheless, because the DOW effects are not robust to different time periods and they are not persistent in a long-run with an exception of Slovenia, I conclude that examined countries do not provide consistent evidence to support the presence of any significant daily patterns in stock market returns of the CEE-countries and Russia. The obtained results are corresponding to ones reported by Ajayi et al. (2004). Moreover, considering capitalization on the day-of-the-week effect, the trading rules in all probability will not give an investor a positive return in the presence of trading costs because of the frequent trading the investment strategy would demand.

7.2 Month-of-the-Year Effect

Whole sample period 1997- February 2008

Tests for seasonality in monthly returns are shown in Annex 2, Table 14. In general, it seems that most profitable months occur during October-February period and losses are rather bunched during the summer months from May to September. These patterns are in compliance with Hong and Yu (2006), suggesting that summer returns are lower than during the rest of the year due to vacation periods and the reduced risk with absence of

noise (liquidity) traders. The regression results on Equation (5) reveal diverse monthly patterns in 10 countries and two benchmark indices. In Latvia and Poland there are no months with a significant dummy coefficients, hence the returns are distributed rather evenly across the year in these states. January effect, with positive abnormal returns is provisionally noted in Croatia, Lithuania, Romania and Slovenia. There are also indications of lofty turns in December in the Czech Republic, Hungary, Russia and the MSCI Europe index. This could imply that in these countries along with participation of sophisticated international investors the formerly known January effect has transformed to a December effect. It would be an indication of investors' controversial measures to capitalize on January anomaly. Additionally, as in the developed markets, consumption tends to markedly expand in the last quarter of the year and particularly in December, which might also cause optimism in several markets for the New Year. Otherwise, seasonalities are somewhat scattered across months. There is one negative month that is significantly different from zero in Estonia in September, but only at 10% risk level.

As stated previously, for the anomaly to be applicable, monthly returns must be significantly different from each other. This is tested using Equation (6) and the F-test. The analyses in Annex 2, Table 15 demonstrate that monthly patterns which could be qualified as anomalous are found only in Estonia and Slovenia in addition to the MSCI Europe index. In Estonia, March (6.15%) and August (5.57%) are profitable and September (-6.28%) is loss making at 10% level. The latter incident can be attributed to a lagged reaction to Russian financial crisis and default in August 1998, because close examination shows that during September in 1998, Estonia experienced steepest decline in returns, for the whole sample period, that amounted to -40 percent. F-test allows to reject the null hypothesis of equally distributed monthly returns in Slovenia for January (5.04%) and July (5%), since they are found to be significantly different from other months of the year at 5% level. The MSCI Europe index displays anomalously positive patterns in October (2.79%) and December (3.39%) at 10% significance level. Thus, there is evidence for possible appearance of January effect only in Slovenia.

First Sub-period 1997-2000

This time span is noticeably affected by Russian default in 1998, as presented in Table 16. Stock markets in eight countries and all benchmark indices reacted gloomily to the event. For Croatia, Hungary, Romania, Russia along with the MSCI indices equity prices declined sharply and as a result the average August return is significantly below zero at least on 10% level for these indices. As mentioned in the previous paragraph, I suggest that the event is shown in Estonian returns with a lag in September since August yields are positive at 10% significance. However, also other patterns emerge. For example December is found to be positive for Hungary, Poland and the MSCI Europe index. And once again, Slovenia shows signs of January effect. Bulgaria is excluded from this period's analyses because there were only two monthly observations for the sub-period.

The conducted F-test results are illustrated in Table 17. The null hypothesis can be rejected merely in case of Estonia and Slovenia. In Estonia May (-14.35%), August (14.16%) and September (-17.82%) returns are significantly different from other months at 10% risk level. The conclusion is similar for Slovenia, since January (11.23%) and July (8.39%) yields are significant at 5% level.

Second Sub-period 2001-2004

As seen in the DOW section, this sub-period has a tendency for seasonal effects given that monthly patterns are found in every sample index. Both significantly negative and positive irregularities are found in Table 18. This could be attributed to increased international cash flow to these markets and boosting domestic economies. First of all, there are positive patterns found in November for Croatia, Estonia, Slovakia and the benchmark indices. Secondly, there are anew signs of January effect in Estonia, Hungary, Romania and Russia. Additionally, there are four countries exhibiting irregularities in July; positive for Bulgaria, Latvia and Lithuania and negative for Russia at least on 10% significance level. In line with the *information hypothesis*, July is often the time of the year when the half yearly financial results for most listed companies are released. Thus,

the published accounting information can induce investors and speculators to increase their trades during the month on the expectation of improved performance for the duration of the second half of the year.

There are also other occasional patterns. The New York terrorist attack in September 11th, 2001 is observed to affect all other stock markets negatively, exempt Lithuania and Slovakia. Yet, for the entire sub-period the consequences were not strong enough to influence countries mean September returns significantly. Because the monthly average returns for the MSCI indices are smaller in comparison with the transition economies, the 9/11 incident is reflected as significantly negative p-values for the September dummy coefficients.

Further examination in Table 19 reveals, that the F-test results allow to reject the null hypothesis of equally distributed monthly returns for Hungary and the MSCI Europe. In Hungary, there are five months that stand out in comparison with the rest of the year and the patterns are both negative and positive at 5% significance level. What comes to MSCI Europe index, the returns seem to be generated for the duration of this period on average only during August and throughout October-December period while all other monthly mean returns are loss making. However, comparatively to the rest of the year only September (-5.03%), October (5.80%) and November (4.43%) diverge at 10% level.

Third Sub-period 2005-February 2008

According to Table 20, in comparison with previous sub-periods there is a prominent decrease observed in terms of monthly seasonalities. Overall, July and December produce positive returns for all countries and May seems to be the worst month during the year. Nevertheless, indications of positive yields being significantly different from zero are found during February in Bulgaria and Slovakia as well as on April in Slovenia. On the other hand, May is negative for Latvia on average.

The F-test presented in Table 21 affirms that there are not any monthly unequal distributions of returns perceived. Hence, there is no statistical evidence on predictability of monthly returns or violation of the EMH during the last sub-period.

As a conclusion, MOY effect is distinguished as follows:

1. 1997 to February 2008: Estonia (positive March and August as well as negative September*), Slovenia (positive January and July**), the MSCI Europe index (positive October and November, negative September*).
2. 1997 to 2000: Estonia (positive August and negative May as well as September*), Slovenia (positive January and July**).
3. 2001 to 2004: Hungary (positive January, August and October whereas February and June are negative**), the MSCI Europe index (positive October and November and negative September*).[14]
4. 2005 to February 2008: no evidence on significant monthly effects.

The obtained results are fairly inconsistent to Asteriou and Kavetsos (2006) who found strong evidence on presence of January effect in Hungarian, Polish, Romanian and Slovakian stock markets (during 1991 to May 2003). There is an indication of superior January returns for Slovenia during the whole time-period and the first sub-period. Also Hungary show signs of January pattern but only during the second sub-period. Thus, there is no consistent evidence in support of *tax-loss selling hypothesis*. Though, the investigated period used in this study is more concentrated on the 21st century whereas Asteriou and Kavetsos study is rather based on the 1990's. In addition, the methodology used is slightly different. However, these results could also imply that if the anomalies existed in the sample period in which they were first identified, the activities of market

[14] Notes: ***, ** and * indicate statistical significance for multiple hypotheses F-test at the 1%, 5% and 10% level respectively.

participators who implemented strategies to capitalize on the January effect have caused anomaly to disappear. Hence, these markets have become more informationally efficient.

Furthermore, the evaluation of monthly patterns reveals that in many countries December offers relatively large returns throughout the sample period, even though not significantly so when employing the F-test. In accordance with the EMH hypothesis, these results could as well entail that investors are exploiting previously documented market trends by acquiring equities in December and therefore the markets have adjusted for the January anomaly.

Overall, there is not much consistent empirical evidence that the CEE or Russian stock markets are violating the weak form of market efficiency in terms of month-of-the-year anomaly. Even though some mentionable monthly patterns exist, they are not persistent and seem to disappear through the investigated time-periods either because of EU accession or purely due to controversial procedures of market participants. Observed deviations from weak form market efficiency can be argued to be relatively unimportant and infrequent in scope of the totality of market transactions. Therefore, there is some support to the informational efficiency aspect of the market efficiency hypothesis. In this concurrence, it does not seem reasonable to discuss any investment strategies based on the month-of-the-year effect.

7.3 Turn-of-the-Month Effect

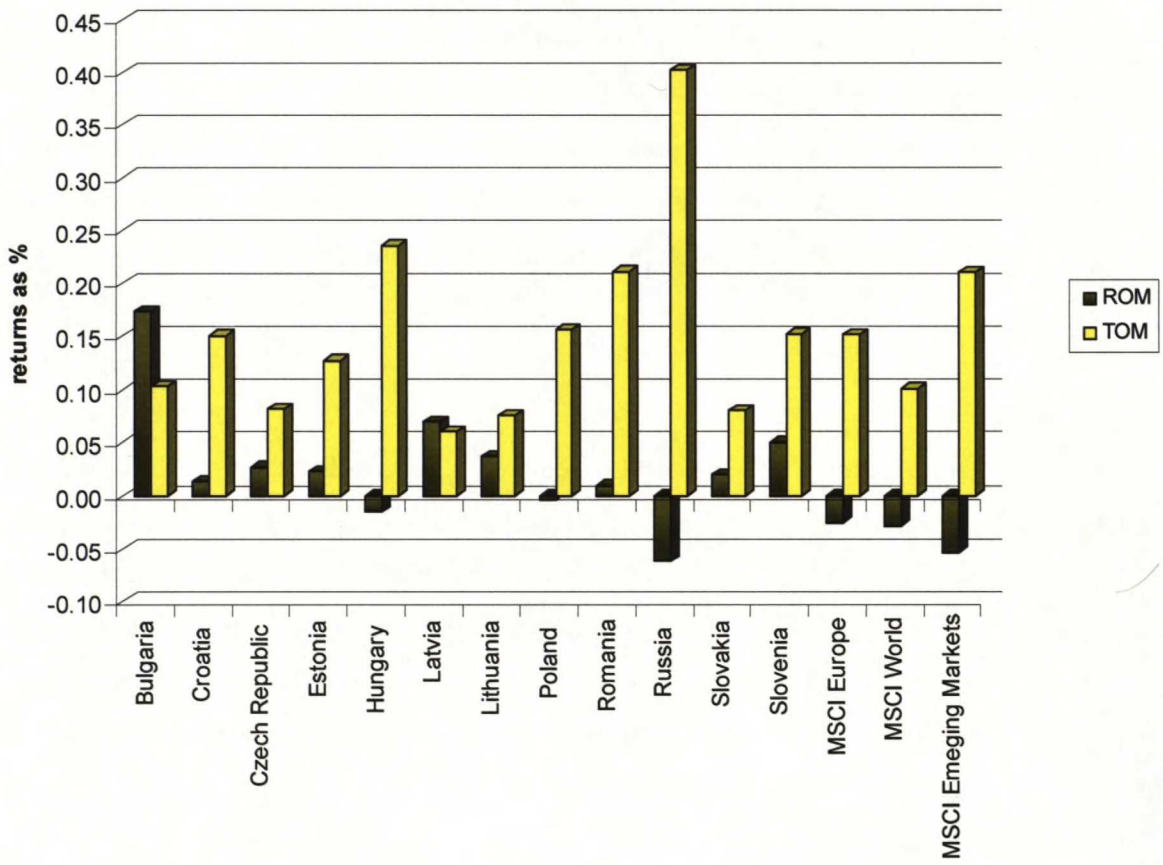
Whole sample period 1997- February 2008

First I inspect the 16 trading days around the turn-of-the-month to determine if any of the mean daily returns are significantly different from zero. The results for Equation (7) are presented in Annex 3, Table 22. An examination of the proceeds shows that most significant positive returns cluster around the TOM period, trading days -1 through +4. Over this 5-day TOM period nine countries and all MSCI benchmark indices have at least one return that is positive and significantly different from zero, and five countries as well as the MSCI Europe and the Emerging Market indices have two to four returns that are

meaningfully positive. Only in five states there is an indication of negative returns during the 5-day TOM period, none of which is significant. The trading days -4 through -2 seem to be the worst throughout the 16-day event window. There are patterns of negative mean returns for several countries and especially on the trading day -2, which are significant for Poland, Russia and Slovakia.

Having established, than an apparent TOM pattern exists, TOM effect is tested directly by comparing TOM returns to the rest-of-the-month (ROM) returns with an Equation (8). Figure 2 displays the distribution of mean daily returns for the ROM [-8, -2; 5, 8] and TOM [-1, 4] periods respectively.

Figure 2: Average Daily Percentage ROM and TOM Returns for the Whole Sample Period



As can be seen from Figure 2, for most countries there are visible distinctions between the ROM and TOM period. Returns over the TOM period are in general larger than ROM proceeds. Typically the ROM returns are close to zero, or even negative. Only in Bulgaria and Latvia the average ROM returns outperform the TOM proceeds. The TOM pattern is most pronounced in Hungary, Poland, Romania, Russia and all MSCI indices. Following paragraph presents the statistical analyses conducted for the Equation (8).

The intercept in Annex 3, Table 23 shows that three countries and all MSCI indices have negative ROM returns. Yet, only for MSCI Emerging Market index, the p-value is significant at 5% risk level. Furthermore, merely two states have ROM returns that are positive and significantly different from zero. The coefficients on the TOM dummy variables specify that every other country and benchmark index, except Bulgaria and Latvia, have positive TOM returns. Additionally, in Croatia, Hungary, Poland, Romania, Russia and Slovenia along with MSCI indices the mean returns during the TOM period are greater than average yield for the ROM period. The F-statistic results allow to reject the null hypothesis of equally distributed mean returns between the TOM and the ROM period for all the aforesaid indices (at least on 10% level). Thus, the first test finds a TOM effect in six out of twelve countries and all MSCI indices.

First Sub-period 1997-2000

From 1997 to 2000, the ROM mean proceeds are positive in Bulgaria and Slovenia and negative for the rest of the countries as well as the MSCI indices, as shown in Table 24. Nevertheless, just MSCI Emerging Market negative returns are significantly different from zero at 0.1% level. During this time-period, all TOM yields are positive for each index. In Croatia, Hungary, Poland, Russia, Slovenia and the MSCI indices they are also positive and significantly different from zero. Furthermore, the F-test statistics allow to reject the null hypothesis in abovementioned countries (at least on 10% level). Consequently, TOM effect is detected in five states and all MSCI indices.

Second Sub-period 2001-2004

The results for the second sub-period are presented in Table 25. The returns seem to be more equally distributed throughout the month, comparatively to the whole sample or the first sub-period. These outcomes are somewhat in contradiction with previously reviewed analyses, since DOW and MOY patterns were mainly expressed during this sub-period. However, as explained previously, the respective economies have been expanding considerably during 2001-2004. Thus, it is intuitively comprehensible that this kind of flourishing growth in returns is not restricted merely to the beginning of the month.

ROM yield is positive in 11 out of 12 countries and significantly different from zero at least on 5% level in Bulgaria, Estonia, Latvia, Romania, Slovakia and Slovenia. Interestingly, for all benchmark indices coefficients on the TOM dummy variables are still negative and significantly so for MSCI World index, but only at 10% risk level. TOM period offers somewhat smaller mean returns than the ROM period in five countries. Yet, the negative difference is meaningful only for Latvia (at 10% level). Positive average proceeds are found for the TOM period in eight states and all MSCI indices. Significantly larger TOM returns are found in Hungary, Russia and the benchmark indices. The p-value of F-statistics confirms the obtained results as well (at least on 10% level). In Latvia, an adverse TOM effect is observed, since the F-test prove that ROM yields are larger than TOM returns at 10% level.

Third Sub-period 2005-February 2008

For the last sub-period, Table 26 illustrate that in general the TOM effect is least pronounced in comparison with previous phases. The ROM returns are positive for 10 countries and significant in Bulgaria, Croatia and Russia. Also the benchmark indices show positive yield during the ROM period for the first time, even though not significantly. Allegedly, this fact can be attributed to favorable growth of the equity earnings and worldwide bull markets. What comes to the TOM returns, they are positive for every other index, except Bulgaria and Croatia. The difference between ROM and TOM average income is significant in favor of TOM returns in the Czech Republic,

Romania, Russia and MSCI Emerging Mark index. Looking at the F-statistics, the null hypothesis is rejected in aforesaid indices at least on 10% risk level.

To recapitulate, the TOM effect is found in the sample countries consequently:

1. 1997 to February 2008: Croatia*, Hungary***, Poland**, Romania**, Russia***, Slovenia** and all MSCI indices***.
2. 1997 to 2000: Croatia**, Hungary**, Poland**, Russia**, Slovenia* in addition to MSCI Europe***, World** and Emerging Market*** indices.
3. 2001 to 2004: Hungary***, Russia* and MSCI Europe**, World** and Emerging Market*** indices.
4. 2005 to February 2008: the Czech Republic*, Romania*, Russia* and MSCI Emerging Market index**[15].

The effect is recognized to be most persistent in Russia, Hungary and the benchmark indices. In Hungary, the effect disappears after ownership structure reorganization, when Austrian banks acquired majority stake in Budapest Stock Exchange in 2004. The results are somewhat mixed for Croatia, Poland, Romania and Slovenia. So there is some evidence on the predictability of returns in these economies. The obtained results are rather accordant to previous international studies (Ariel, 1987; Martikainen et al., 1994; Kunkel et al., 2003). I find that during the whole sample period, the 5-day TOM period accounts for 85% of the monthly return, on average, across six stock markets where the TOM pattern exists. The effect is even stronger for the benchmark indices.

Markedly, the effect shows evidence of declination in most states, which could be taken as a sign of increased market efficiency from 2001 onwards. Thus accession of the EU and amendments in stock market regulation may have had some positive impact on price generation process and market efficiency as a whole in the CEE-countries. The fact that Russia (not being an EU member) demonstrates evidence on persistence of TOM

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[15] Notes: ***, ** and * indicate statistical significance for multiple hypotheses F-test at the 1%, 5% and 10% level respectively.

anomaly throughout the sample period supports this suggestion. Though, the statistical significance of the pattern seems to be diminishing also in Russia. However, there might be also other factors (such as liquidity and information release issues) explaining the anomalous behavior of returns in Russia that will be discussed in the following paragraphs.

What comes to underlying reasoning for the existence of the TOM effect, I would argue that it is most associated with the *turn-of-the-month liquidity* and *window dressing hypotheses*. The former suggests that individual and institutional investors' increased cash flow during the turn-of-the-month raises the demand for equities and therefore augments the profitability of the TOM period. First of all, the countries exhibiting the anomalous TOM effect e.g. Hungary, Russia and Poland could be considered as those markets with the most eminent presence of international investors via mutual funds. Individual investors in the western markets have saving and investment schemes, which contribute assets on a regular basis to mutual funds from their monthly salaries. Thus, I'm inclined to propose that the pattern is somewhat a spill over effect from the more developed markets. In comparison to other sample countries, Russian stock markets have lured a greater quantity of investment funds placing capital in the region. Therefore, the TOM pattern might be more permanent in Russian markets.

Secondly, the aforesaid equity markets have been showing for the most part steadiest and strongest market capitalization growth. Lacking a doubt, this expansion could not be achieved without the contribution of local individual investors, hence more or less ordinary wage earners. Therefore, the TOM anomaly could be partly caused by unevenly distributed capital inflows from the domestic inventors'.

The *window dressing hypotheses* associates the anomaly with institutional investors' portfolio revision by the end of the month, which is a logical continuation to the *liquidity hypothesis*. In western stock markets, the role and participation of institutional investors constitutes extensively to the equity price formation process. The analyses carried out reveal, that MSCI Europe index demonstrate fairly persistent TOM pattern, which

accordingly can be contemplated to institutional investors' behavior activities. For that reason I draw a conclusion that because the benchmark indices exhibit a fairly constant TOM anomaly, particularly the MSCI Emerging Market index, it must be to some extent caused also by institutional investors' acquisition patterns.

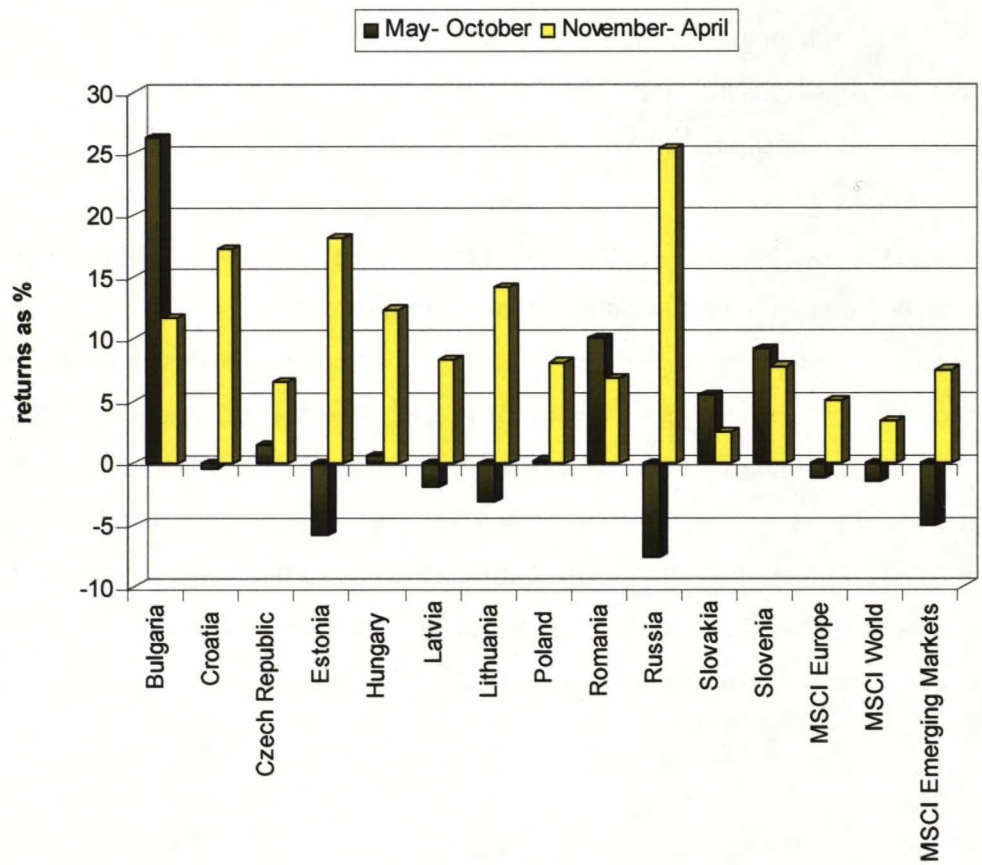
Apart from these, *information release hypothesis* and predominantly economic news publication could provide a justification for existence of depicted TOM patterns. For instance Nikkinen (2007) shows that the anomaly arises from clustered macroeconomic news announcements at the turn-of-the-month in the US. Once the news announcement factor has been included in the regression as an explanatory variable, TOM effect disappears. Testing for such a hypothesis in the CEE and Russian stock markets would require obtaining data about historical economic news, which may be a good topic for future research.

Taking into consideration the profit opportunities to capitalize on the existence of this effect, there could be some buying and selling patterns suggested. For active traders the strategy based on the purchase of stocks or index tracking funds during the last 7 days of the month (exempt trading day -1) and especially during the event window of [-4,-2] while selling them throughout [-1, 4] might be a profitable timing strategy. I do not conduct an examination of this strategy in presence of trading costs. However, Listola (2004) analyzes the returns of a trading strategy based on the pre-holiday effect, which could be considered as rather similar to the exploitation of the TOM pattern, and concludes that sophisticated computerized trading programs produce statistically significant abnormal return close to one percent even after the adjustment for the trading costs. Furthermore, also small investors could benefit from the TOM effect as sellers or buyers by obtaining better prices employing the above mentioned timing strategy.

7.4 Halloween Effect

Figure 3 presents preliminary examination of the phenomenon illustrating the compounded annual six months returns in the period May-October and the period November-April for each country.

Figure 3: Average Annual Returns as Percentages for May-October and November-April Periods in the Sample Countries and the Benchmark Indices for the Whole Sample Period



As shown in Figure 3, the differences in returns in the two half-year periods are generally quite large and economically significant[16]. Returns over the period May-October tend to

[16] Transaction costs will barely affect an investor who would trade on these results. For instance, assuming transaction costs of 0.5 percent for a single transaction the annual return would drop with approximately 1%. (Bouman and Jacobsen, 2002)

be close to or even below zero in many countries and all benchmark indices, with an exception of Bulgaria, Romania, Slovakia and Slovenia. In eight countries average returns over this six-month period do not exceed two percent. However, during the period November-April they surpass 6.4 percent in all states, except in Slovakia. In Russia and Estonia the difference is most substantial: returns are more than 30 and 23 percent higher respectively, between November and April than they are during the remainder of the year. The relevant question is whether these results are also statistically significant.

The results for Halloween effect and Equations (9 and 10) are presented in Annex 4, Table 27. The outcomes of the analysis are mixed across countries and somewhat consistent with previous research (Bouman and Jacobsen, 2002; Lucey and Wheelan, 2002). The monthly mean return over May-October period is lower than November-April mean return in eight out of twelve countries. Moreover, May-October average return is negative in five countries and in all MSCI comparative benchmark indices. Yet, May-October return is significantly different from zero only in case of Bulgaria and Slovenia at 1% and 5% risk level respectively and for these countries it is also higher than November-April return. The coefficients for the November-April dummies statistically outperform the comparative constant in Estonia and Russia at 5% level. This pattern is less pronounced for Croatia and Lithuania at 10% level. Also p-values for the F-statistics are significant in these cases and for the MSCI Emerging Market index as well. It could be argued though that these results are inflated by exclusion of dividends in price level indices, as in many countries there is a tendency to pay dividends in May through October.

Since January returns are often relatively high in comparison to other months between November and April, it is sensible to include the January dummy in the regression. These results are presented in Table 27, columns 9-11. The consequences of lofty January return is detected in Croatia, Lithuania along with Estonia and it seems to reduce the magnitude of the Halloween effect. In two latter countries, the p-value for F-statistic is no longer significant; hence Halloween effect is not predominant after the January adjustment. However, by estimating regression (10), all excess returns in January are entirely due to

January effect and not caused by Halloween effect, which might exaggerate the size of January effect while understating the "true" Halloween effect.

After the adjustment for January dummy, Halloween effect remains statistically significant only at 10% level in Croatia and Russia. On the other hand, MSCI Europe index returns are rather low in January, and after adjustment the Halloween effect is revealed to be significant at 5% level. While in Slovenia, January returns are reasonably high and as a result the p-value of the F-statistics becomes noteworthy.

One explanation for so strong presence of the Halloween effect in Russia could be contemplated to the fact that in the Russian economy the distribution of inflation is not equal throughout the year. During the 21st century the average annual inflation has amounted to 14% (EBRD, 2008). Usually, the median of the forecasted inflation value is reached at some stage in March-April period and is compensated by lower inflation figures during the second half of year. It can indirectly fortify the increase of demand and consequently elevate the equity prices in the beginning of year. Furthermore, as clarified in section 7.2, the average summer (May to September) monthly returns generally tend to be inferior to those obtained during the rest of the year. Thus, vacations and decreased trading activity during the summer months provide another obvious reasoning for the Halloween anomaly (Hong and Yu, 2006). Consequently, after presenting the results for the MOY effect and concluding that there are some scattered monthly patterns which are not robust to different time periods I am disposed to agree to a conclusion presented by Lucey and Wheelan (2002). Authors suggest that other calendar month anomalies could be possibly better and more parsimoniously ascribed to the half-year Halloween effect.

To estimate the economic importance of the Halloween strategy against holding the market index portfolio throughout the year, I form a Halloween portfolio with six months investment in short term interest rates, as explained in section 6.2. Now, trading costs of 0.5% for a single transaction are included two times a year[17]. Unfortunately, the

[17] Bouman and Jacobsen (2002) argue that certain managers charge transaction costs only once when an investor switches funds in stead of two times 0.5% when buying and selling. Moreover, they state that large

assessment of taxation on short-term capital gains is beyond the scope of the study, since they have been altering for several times in each country. Therefore, inclusion of taxation expenses could affect the significance of obtained results and would be a logical extension for future research. Table 5 contains the average annual returns and the standard deviation of the Buy and Hold and the Halloween strategy. These results show that the Halloween strategy outperforms the Buy and Hold strategy in Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland and Russia as well as for all MSCI indices. The standard deviation of the Halloween strategy is substantially lower in comparison to the Buy and Hold strategy in all countries and benchmark indices.

Table 5: Average Annual Returns and Standard Deviations of a Buy and Hold and the Halloween Strategy for the Whole Sample Period

Country	Buy and Hold Strategy		Halloween Stategy	
	Mean	Std.Dev.	Mean	Std.Dev.
Bulgaria	40.16	22.93	16.40	21.62
Croatia	18.01	22.20	24.20	18.84
Czech Republic	10.86	21.35	14.64	16.21
Estonia	14.95	46.64	33.09	36.86
Hungary	16.99	25.23	24.97	20.05
Latvia	8.97	53.61	15.67	19.92
Lithuania	10.14	37.69	18.47	16.70
Poland	11.79	20.27	21.22	13.56
Romania	25.10	37.52	18.22	21.28
Russia	22.21	74.58	42.45	46.98
Slovakia	8.34	30.54	6.98	23.60
Slovenia	18.45	18.41	12.68	15.79
MSCI Europe	8.01	18.52	13.21	10.58
MSCI World	6.18	16.46	9.20	10.40
MSCI Emerging Markets	6.54	30.95	15.79	14.45

Furthermore, I test whether I am able to reject the mean variance efficiency of the indices in different countries. The estimation results and statistical significance for an Equation (11) are reported in Annex 4, Table 28. The alpha coefficients (Jensen's alpha describes how much the annual return of the strategy has exceeded the return of a corresponding

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institutional investors, e.g. the Robeco Group estimates transaction costs in France 0.3%, the US 0.25%, and the Netherlands 0.3%. These estimates give an indication, and are not precisely accurate due to complexity of tax and commission systems.

index portfolio) are positive and significantly different from zero in case of Estonia, Hungary, Poland, Russia and all the MSCI indices. Alpha coefficients amount to 21.8%, 12%, 10.1% and 23.8% in respective countries. However, the p-value of F-statistic is not significant for the regressions in Hungary and Poland and consequently the null hypothesis of alpha being zero is rejected only for Estonia and Russia as well as all the MSCI indices. Bouman and Jacobsen (2002) argue that the Halloween effect is particularly strong in European countries. Such a statement is confirmed in this study by highly significant excess alpha returns 8.1% (at 1% risk level) for the MSCI Europe index. Thus for abovementioned indices, there is a clear indication of market timing ability. These outcomes are in line with previous results. In Bulgaria and Romania, Jensen's alpha is negative, suggesting that the Halloween strategy is not offering superior returns in these countries and on the contrary is inferior to investment in market indices.

As seen from Table 28, the estimates for β coefficients, the measure of volatility of a Halloween portfolio in relation to the market indices are well below 1. In the Czech Republic, Estonia, Latvia, Lithuania and Russia as well as MSCI indices significantly so, at least on 10% level. In Latvia and Lithuania Jensen's alphas are positive, but not significant while the level of volatility is meaningfully beneath 0.37, subsequently raising the p-values of the F-statistics. These results lead to a conclusion, that the Halloween strategy is substantially less risky than investing in the market index in the respective countries. Therefore, the "Sell in May" rule could be especially suited to the risk-averse investors, as it seems to remove unrewarding risk. If wrong, the disadvantage is an opportunity cost – the compensation is halved as well as the risks.

What comes to the implementation of the strategy, it might be difficult to mimic stock indices in practice. Bouman and Jacobsen (2002) suggest that firstly, one could employ this trading strategy using index futures. In that case the transaction costs are considered to be also much lower[18]. Secondly, they suggest that the trading strategy could be

[18] For instance, Solnik (1993) estimates round-trip transaction costs of 0.1% on futures contracts.

exercised by using index-tracking funds that have an extremely high correlation with market indices.

Considering rather short sample period (i.e. $N = 11$) I do not test for the persistence of the anomaly. The small sample size also sets limitations on the generalization of the results. One more consideration remains regarding the Halloween strategy implementation in different market circumstances. Equity markets have been mostly soaring during the period under investigation. Thus, it remains unsolved how the strategy would perform under bear markets. However, Bouman and Jacobsen (2002) state that on average the Halloween strategy does well when judged on its ability to time bear and bull markets.

8 Conclusions

The assumption that stock prices are random is basic to efficient market hypothesis (EMH) and capital asset pricing models. This study has presented evidence focusing on the weak form efficiency and calendar anomalies that violate the EMH. This thesis examined four different calendar anomalies: day-of-the-week, month-of-the-year, turn-of-the-month and Halloween effects in stock markets of Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Russia, Slovakia and Slovenia. The study commenced with an assessment of the methodologies applied. Subsequently, study employed the Ordinary Least Square (OLS) regression analyses to determine whether the studied calendar anomalies existed in the selected countries.

In order to portray the specific conditions of studied markets the thesis initiated with a description of the stock exchanges and their evolvement in the respective countries. The purpose of the following theoretical part aimed to provide a concrete background for the empirical research. The essential theory, the efficient market hypothesis, was introduced at first. After that, the thesis offered a comprehensive illustration of every anomaly investigated. The clarifications for the existence of the anomalies were provided in conjunction with the descriptions of each calendar pattern.

The data set investigated in this thesis comprised from daily price level return series of respective stock market indices from January 1997 to February 2008. To assess the persistency of the anomalous phenomena, these patterns were studied as a full sample period and three sub-periods. In order to evaluate the obtained results against other stock markets, analyses were also conducted with the MSCI Europe, World and Emerging Market indices as comparative benchmarks.

There were several day-of-the-week patterns found in the stock returns of examined countries and the MSCI indices. In line with international studies (Lakonishok and Maberly, 1990; Choudry, 2000; Mlambo and Biekpe, 2006) the positive proceeds were clustered towards the end of the week i.e. Thursday and Friday while negative returns were observed mostly during the beginning of the week i.e. Monday and Tuesday. However, within the examination of different phases the null hypothesis of equally distributed daily returns was rejected in case of Bulgaria, Estonia, Lithuania, Hungary, Russia and Slovenia. The constancy analyses showed that the findings were not robust to different time-periods and that daily patterns were not permanent in a long-run with an exception of Slovenia. Even though Slovenian equity returns were most inclined to violate weak form of EMH, daily patterns showed signs of declination after 2001. In absence of consistent and recurrent empirical evidence the study concluded that investigated Central and Eastern European (CEE) countries and Russia do not exhibit any significant day-of-the-week irregularities. The obtained results correspond to Ajayi et al. (2004), who did not find notable presence of daily patterns in eleven Eastern European markets during 1994 to 2002. These findings provide some support to the informational efficiency aspect of the market efficiency hypothesis.

The assessment of monthly patterns in the transition economies revealed that in compliance with Hong and Yu (2006) most profitable months took place during October-November period while losses generally occurred throughout summer months from May to September. These findings are explicable by vacation timing and lessened investing activity during the latter months. The F-tests conducted for different time periods allowed to reject the null hypothesis of equally distributed monthly returns for Estonian,

Hungarian, Slovenian and the MSCI Europe indices. However, there were clear indications of increasing market efficiency, since during the last sub-period from 2005 to February 2008 there was no statistical evidence on significant monthly effects.

The obtained results are somewhat in contradiction with previous international studies given that there was no clear indication of a January effect. Yet, Asteriou and Kavetsos (2006) depicted a strong January effect in Hungary, Poland, Romania and Slovakia during 1991-May 2003. This inconsistency could be, first of all, attributed to disclosure that in many countries December returns were relatively large throughout every sub-period, even though not significantly so when employing the F-tests. These results could imply that market participators have exploited well documented market trends by acquiring equities in December, and these measures have driven equity prices towards the equilibrium. According to Fama (1970) and the EMH, this is precisely what should happen in an efficient market. Inefficiencies in pricing, hence calendar anomalies, should disappear after their discovery. Secondly, individual investors' are increasingly utilizing tax-sheltered retirement plans and therefore have no reason to sell stocks at the end of the year for a tax loss.

Overall, albeit some mentionable monthly patterns were observed, they were not persistent and seized to exist during the last sub-period investigated. This evolvement can be attributed to the EU accession, the growing awareness of the importance of standards of corporate governance, gradual integration with the developed capital markets or else purely to controversial procedures of market participants. As a result, to a large extent there was no consistent empirical evidence that the CEE or Russian stock markets are violating weak form of market efficiency in terms of the month-of-the-year anomaly.

The turn-of-the-month (TOM) effect was depicted in nine examined countries and all benchmark indices. In line with worldwide studies (Ariel, 1987; Martikainen et al. 1994; Kunkel et al., 2003) the average returns generated during trading days -1 through +4 outperformed the other days of the month. During the whole sample period, the anomaly was statistically significant at least on 10% risk level in Croatia, Hungary, Poland,

Romania, Russia, Slovenia and all the MSCI indices. Across these six stock markets, the average 5-day turn-of-the-month yield accounted for 85% of the monthly return.

The effect was recognized to be most persistent in Russia and Hungary as well as in all benchmark indices. The results were somewhat mixed for Croatia, Poland, Romania and Slovenia. Markedly, the anomalous pattern showed signs of declination in most states, from 2001 onwards. Hence, the accession of the EU may have had favorable impact on market efficiency as a whole in the CEE-countries. Because the TOM effect was spotted typically in those stock indices with an apparent presence of international investors, the pattern is ascribed to some extent to a spill over effect from more developed markets and institutional investors' behavior. However, Nikkinen (2007) showed that the anomaly arises from clustered macroeconomic news releases at the turn-of-the-month. Testing for such a hypothesis would require obtaining data about historical economic news and it may provide a productive topic for future research.

From this perspective, though not tested in this thesis, a strategy based on buying and selling patterns around the turn-of-the-month could endow an investor with profit opportunities. Additionally, small investors could benefit from the TOM effect as sellers or buyers by obtaining better prices whilst employing the results presented in this study.

Based on the results of the analyses conducted, it seems that the old saying "Sell in May and Go Away" generated comparatively abnormal returns in five out of twelve examined stock markets. Also the results on all benchmark indices support that this trading rule works with economic significance. In line with Bouman and Jacobsen (2002) and Lucey and Wheelan (2002), this out-performance seems to be possible with a strategy that is less risky than simply holding the market index, measured either by standard deviation or beta. After correcting for risk, the study showed that this out-performance is statistically significant in the Czech Republic, Estonia, Latvia, Lithuania, Russia and all the MSCI indices. Jensen alpha in aforementioned countries, describing the excess annual return in comparison with the market portfolio, amounted to 6.6% in the Czech Republic, 21.8% in Estonia, 8.5% in Latvia, 9.0% in Lithuania and to 23.8% in Russia. It therefore looks like

stock returns can to some extent be predicted on the basis of their own past performance by employment of this strategy.

Nevertheless, inclusion of taxation on short-term term capital gains and dividends that are not taken into account in the price level indices, may affect the magnitude of obtained results on the Halloween effect. Therefore, taking these matters into consideration would be a sufficient expansion for a follow-up study.

The major conclusion of this thesis is that in the CEE-countries and Russia, stock markets are weakly efficient in terms of day-of-the-week and month-of-the-year anomalies. There is yet evidence that stock returns in some countries are predictable based on the turn-of-the-month and Halloween calendar patterns. In other words, investors can take advantage of information accessible in this thesis. However, in compliance with Schwert (2002), the anomalous calendar effects are becoming less pronounced and therefore the weak form efficiency has increased steadily during the sample period in all examined countries.

The extant patterns seem to be explained by the combination of various factors such as settlement procedures, liquidity issues, window-dressing, information processing and last but not the least, measurement errors. While this study provides additional insights into behavior of stock market returns in the transition economies, stock returns seasonality is still not fully understood. No explanation yet is sufficient completely for these phenomena by providing direct evidence. Therefore, further research should be undertaken not only to conform the results of the present study but also to investigate alternative justifications and refine the existing factors that keep the calendar anomalies still alive in stock markets.

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Appendices

Annex 1: Tests for the Day-of-the-Week Effect

Table 6: Day-of-the-Week Effect during the Whole Sample Period 1997-2008

Results for the regression $R_t = \alpha_1 D_{1t} + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$ are presented for the whole sample period 1997-2008. For each index estimated coefficient, t-value and p-value are shown.

Country		Monday	Tuesday	Wednesday	Thursday	Friday	F-statistic	p-value
Bulgaria	coefficient	0.043	0.090	**0.242** ***	0.054	**0.264** ***	**3.406** ***	0.005
	t-statistic	0.474	0.990	2.658	0.597	2.898		
	p-value	0.636	0.322	0.008	0.551	0.004		
Croatia	coefficient	-0.052	**0.130** *	0.096	0.051	0.072	1.481	0.193
	t-statistic	-0.736	1.854	1.361	0.729	1.021		
	p-value	0.462	0.064	0.173	0.466	0.307		
Czech Republic	coefficient	0.008	0.070	-0.020	0.077	0.048	1.017	0.406
	t-statistic	0.164	1.347	-0.395	1.495	0.924		
	p-value	0.870	0.178	0.693	0.135	0.356		
Estonia	coefficient	-0.128	0.103	**0.182** **	0.073	0.048	**1.886** *	0.093
	t-statistic	-1.510	1.209	2.149	0.864	0.569		
	p-value	0.131	0.227	0.032	0.388	0.570		
Hungary	coefficient	**0.151** **	0.045	0.003	-0.017	0.116	1.464	0.198
	t-statistic	2.078	0.620	0.048	-0.240	1.600		
	p-value	0.038	0.535	0.962	0.810	0.110		
Latvia	coefficient	0.010	0.055	-0.097	0.045	0.135	0.891	0.486
	t-statistic	0.118	0.644	-1.126	0.519	1.578		
	p-value	0.906	0.519	0.260	0.603	0.115		
Lithuania	coefficient	-0.021	-0.023	-0.035	**0.163** **	0.105	**1.920** *	0.088
	t-statistic	-0.324	-0.356	-0.548	2.529	1.636		
	p-value	0.746	0.722	0.584	0.012	0.102		
Poland	coefficient	0.068	0.001	-0.062	0.067	**0.132** **	1.650	0.143
	t-statistic	1.126	0.011	-1.027	1.103	2.170		
	p-value	0.260	0.991	0.304	0.270	0.030		
Romania	coefficient	0.005	0.073	0.046	0.101	**0.145** **	1.450	0.203
	t-statistic	0.070	0.993	0.630	1.388	1.983		
	p-value	0.945	0.321	0.529	0.165	0.047		
Russia	coefficient	0.120	0.051	-0.136	0.075	**0.289** ***	**2.103** *	0.062
	t-statistic	1.103	0.471	-1.246	0.694	2.654		
	p-value	0.270	0.637	0.213	0.488	0.008		
Slovakia	coefficient	-0.005	-0.013	-0.006	0.069	**0.112** **	1.253	0.281
	t-statistic	-0.093	-0.248	-0.116	1.306	2.116		
	p-value	0.926	0.804	0.907	0.192	0.034		
Slovenia	coefficient	-0.011	**-0.103** *	**0.099** **	**0.165** ***	**0.177** ***	**9.437** ***	<0.001
	t-statistic	-0.269	-2.512	2.412	4.043	4.317		
	p-value	0.788	0.012	0.016	<0.001	<0.001		
MSCI Europe	coefficient	0.003	0.038	-0.034	0.064	0.063	0.939	0.454
	t-statistic	0.058	0.799	-0.714	1.337	1.325		
	p-value	0.954	0.424	0.475	0.181	0.185		
MSCI World	coefficient	0.010	0.028	0.020	0.023	0.017	0.320	0.901
	t-statistic	0.286	0.780	0.541	0.622	0.478		
	p-value	0.775	0.435	0.589	0.534	0.633		
MSCI Emerging Markets	coefficient	-0.034	0.033	0.021	-0.007	**0.101** **	1.207	0.303
	t-statistic	-0.737	0.712	0.446	-0.150	2.182		
	p-value	0.461	0.476	0.655	0.881	0.029		

Notes: ***, **, and * indicate statistical significance for a two-tailed t-test at the one, five and ten percent level respectively.

Table 7: Tests for the Explicit Day-of-the-Week Patterns for the Whole Sample Period

Monday

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$, where the intercept, c, represents the Monday and the coefficient α_i, $i = 2,\ldots, 5$, indicates the difference in returns between the Monday and the ith day of the week.

Country		*Monday*	Tuesday	Wednesday	Thursday	Friday	F-statistic	p-value
Hungary	coefficient	*0.151*	-0.106	-0.148	-0.169	-0.035	0.987	0.413
	t-statistic	*2.077*	-1.030	-1.435	-1.639	-0.339		
	p-value	*0.038*	0.303	0.151	0.101	0.735		

Tuesday

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$, where the intercept, c, represents the Tuesday and the coefficient α_i, $i = 2,\ldots, 5$, indicates the difference in returns between the Tuesday and the ith day of the week.

Country		Monday	*Tuesday*	Wednesday	Thursday	Friday	F-statistic	p-value
Croatia	coefficient	**-0.182** *	***0.130*** *	-0.035	-0.079	-0.059	0.957	0.430
	t-statistic	-1.831	*1.854*	-0.348	-0.795	-0.589		
	p-value	0.067	*0.064*	0.728	0.427	0.556		
Slovenia		0.092	-0.103	*0.201*	0.268	0.279	**8.599** ***	<0.001
		1.586	-2.512	*3.482*	4.634	4.828		
		0.113	0.012	*0.001*	<0.001 ***	<0.001 ***		

Wednesday

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$, where the intercept, c, represents the Wednesday and the coefficient α_i, $i = 2,\ldots, 5$, indicates the difference in returns between the Wednesday and the ith day of the week.

Country		Monday	Tuesday	*Wednesday*	Thursday	Friday	F-statistic	p-value
Bulgaria	coefficient	-0.199	-0.152	*0.242* ***	-0.188	0.022	1.355	0.247
	t-statistic	-1.543	-1.180	*2.658*	-1.458	0.170		
	p-value	0.123	0.238	*0.008*	0.145	0.865		
Estonia	coefficient	**-0.311** ***	-0.080	*0.182*	-0.109	-0.134	1.819	0.122
	t-statistic	-2.587	-0.663	*2.149*	-0.909	-1.118		
	p-value	0.010	0.507	*0.032*	0.363	0.264		
Slovenia	coefficient	**-0.110** *	**-0.201** ***	*0.099*	0.067	0.078	**8.599** ***	<0.001
	t-statistic	-1.895	-3.482	*2.412*	1.153	1.347		
	p-value	0.058	0.001	*0.016*	0.249	0.178		

Thursday

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$, where the intercept, c, represents the Thursday and the coefficient α_i, $i = 2,\ldots, 5$, indicates the difference in returns between the Thursday and the ith day of the week.

Country		Monday	Tuesday	Wednesday	*Thursday*	Friday	F-statistic	p-value
Lithuania	coefficient	**-0.184** **	**-0.186** **	**-0.199** **	***0.163*** **	-0.058	1.969	0.097
	t-statistic	-2.017	-2.040	-2.176	*2.529*	-0.633		
	p-value	0.044	0.041	0.030	*0.012*	0.527		
Slovenia	coefficient	**-0.176** ***	**-0.268** ***	-0.067	*0.165*	0.011	**8.599** ***	<0.001
	t-statistic	-3.048	-4.634	-1.153	***4.043*** ***	0.194		
	p-value	0.002	0.000	0.249	*<0.001*	0.846		

Friday

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$, where the intercept, c, represents the Friday and the coefficient α_i, $i = 2,\ldots, 5$, indicates the difference in returns between the Friday and the ith day of the week.

Country		Monday	Tuesday	Wednesday	Thursday	*Friday*	F-statistic	p-value
Bulgaria	coefficient	**-0.221** *	-0.174	-0.022	-0.210	***0.264*** ***	1.355	0.247
	t-statistic	-1.713	-1.349	-0.170	-1.628	*2.898*		
	p-value	0.087	0.177	0.865	0.104	*0.004*		
Poland	coefficient	-0.063	-0.131	**-0.194** **	-0.065	***0.132*** **	1.490	0.202
	t-statistic	-0.738	-1.526	-2.261	-0.755	*2.170*		
	p-value	0.461	0.127	0.024	0.451	*0.030*		
Romania	coefficient	-0.140	-0.072	-0.099	-0.043	***0.145*** **	0.529	0.714
	t-statistic	-1.352	-0.700	-0.957	-0.421	*1.983*		
	p-value	0.176	0.484	0.339	0.674	*0.047*		
Russia	coefficient	-0.169	-0.237	**-0.424** ***	-0.213	***0.289*** ***	**1.953** *	0.099
	t-statistic	-1.096	-1.543	-2.758	-1.386	*2.654*		
	p-value	0.273	0.123	0.006	0.166	*0.008*		
Slovakia	coefficient	-0.117	**-0.125** *	-0.118	-0.043	*0.112*	1.127	0.342
	t-statistic	-1.562	-1.671	-1.579	-0.573	*2.116*		
	p-value	0.119	0.095	0.115	0.567	*0.034*		
Slovenia	coefficient	**-0.188** ***	**-0.279** ***	-0.078	-0.011	***0.177*** ***	**8.599** ***	<0.001
	t-statistic	-3.242	-4.828	-1.347	-0.194	*4.317*		
	p-value	0.001	<0.001	0.178	0.846	*<0.001*		
MSCI Emerging Markets	coefficient	**-0.136** **	-0.068	-0.081	**-0.108**	***0.101*** **	1.207	0.305
	t-statistic	-2.064	-1.039	-1.227	-1.649	*2.182*		
	p-value	0.039	0.299	0.220	**0.099** *	*0.029*		

Table 8: Day-of-the-Week Effect during the first sub-period 1997-2000

Results for the regression $R_t = \alpha_1 D_{1t} + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$ are presented for the period 1997-2000. For each index the estimated coefficient, t-value and p-value are shown.

Country		Monday	Tuesday	Wednesday	Thursday	Friday	F-statistic	p-value
Bulgaria	coefficient	-0.464	-0.459	-0.578	**1.092** *	1.061	1.537	0.198
	t-statistic	-0.733	-0.726	-0.913	1.726	1.676		
	p-value	0.467	0.471	0.366	0.091	0.101		
Croatia	coefficient	-0.001	0.105	0.139	-0.135	-0.016	0.412	0.841
	t-statistic	-0.009	0.682	0.903	-0.877	-0.101		
	p-value	0.993	0.495	0.367	0.381	0.919		
Czech Republic	coefficient	-0.090	0.128	-0.058	-0.074	0.036	0.793	0.555
	t-statistic	-0.964	1.370	-0.619	-0.792	0.387		
	p-value	0.335	0.171	0.536	0.429	0.699		
Estonia	coefficient	-0.238	-0.002	**0.376** *	0.050	-0.070		
	t-statistic	-1.120	-0.007	1.777	0.234	-0.333	0.916	0.470
	p-value	0.263	0.994	0.076	0.815	0.739		
Hungary	coefficient	0.254	0.016	0.214	**-0.312** *	0.137	1.737	0.123
	t-statistic	1.570	0.099	1.324	-1.934	0.847		
	p-value	0.117	0.921	0.186	0.053	0.397		
Latvia	coefficient	0.013	0.087	0.015	**-0.466** ***	-0.022	1.406	0.220
	t-statistic	0.075	0.487	0.086	-2.601	-0.125		
	p-value	0.941	0.626	0.932	0.009	0.901		
Lithuania	coefficient	-0.007	-0.135	-0.024	0.166	-0.017	0.498	0.778
	t-statistic	-0.051	-0.986	-0.174	1.212	-0.124		
	p-value	0.959	0.325	0.862	0.226	0.902		
Poland	coefficient	0.088	0.006	-0.119	-0.017	0.147	0.529	0.755
	t-statistic	0.678	0.050	-0.926	-0.132	1.143		
	p-value	0.498	0.960	0.355	0.895	0.253		
Romania	coefficient	-0.124	-0.181	0.008	-0.119	0.065	0.497	0.779
	t-statistic	-0.752	-1.108	0.048	-0.727	0.399		
	p-value	0.452	0.268	0.962	0.468	0.690		
Russia	coefficient	-0.107	0.049	-0.197	-0.242	0.336	0.697	0.626
	t-statistic	-0.422	0.193	-0.778	-0.954	1.326		
	p-value	0.673	0.847	0.437	0.341	0.185		
Slovakia	coefficient	-0.033	-0.110	**-0.187** *	-0.028	0.037	0.896	0.483
	t-statistic	-0.309	-1.032	-1.768	-0.268	0.348		
	p-value	0.758	0.302	0.077	0.789	0.728		
Slovenia	coefficient	-0.094	**-0.216** ***	**0.141**	**0.143** *	**0.171** **	**3.860** ***	0.002
	t-statistic	-1.171	-2.675	1.756	1.780	2.127		
	p-value	0.242	0.008	0.079	0.075	0.034		
MSCI Europe	coefficient	0.060	**0.138** *	-0.039	-0.027	0.089	1.148	0.333
	t-statistic	0.793	1.819	-0.522	-0.360	1.184		
	p-value	0.428	0.069	0.602	0.719	0.237		
MSCI World	coefficient	0.061	**0.119** *	-0.006	-0.056	0.073	1.375	0.231
	t-statistic	0.985	1.916	-0.101	-0.902	1.188		
	p-value	0.325	0.056	0.919	0.367	0.235		
MSCI Emerging Markets	coefficient	-0.111	0.024	-0.027	**-0.209** **	0.056	1.658	0.142
	t-statistic	-1.294	0.286	-0.312	-2.451	0.655		
	p-value	0.196	0.775	0.755	0.014	0.512		

Notes: ***, **, and * indicate statistical significance for a two-tailed t-test at the one, five and ten percent level respectively.

Table 9: Tests for the Explicit Day-of-the-Week Patterns for the First Sub-Period 1997-2000

Tuesday

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$, where the intercept, c, represents the Tuesday and the coefficient α_i, $i = 2,\ldots, 5$, indicates the difference in returns between the Tuesday and the ith day of the week.

Country		Monday	*Tuesday*	Wednesday	Thursday	Friday	F-statistic	p-value
Slovenia	coefficient	0.121	***-0.216*** ***	**0.357** ***	**0.359** ***	**0.387** ***	**4.658** ***	0.001
	t-statistic	1.063	*-2.675*	3.134	3.150	3.396		
	p-value	0.288	*0.008*	0.002	0.002	0.001		
MSCI Europe	coefficient	-0.078	***0.138*** *	**-0.177** *	-0.165	-0.048	1.012	0.400
	t-statistic	-0.726	*1.819*	-1.656	-1.542	-0.452		
	p-value	0.468	*0.069*	0.098	0.123	0.652		
MSCI World	coefficient	-0.058	***0.119*** *	-0.125	**-0.175** **	-0.045	1.245	0.290
	t-statistic	-0.659	*1.916*	-1.428	-1.994	-0.518		
	p-value	0.510	*0.056*	0.154	0.046	0.605		

Wednesday

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$, where the intercept, c, represents the Wednesday and the coefficient α_i, $i = 2,\ldots, 5$, indicates the difference in returns between the Wednesday and the ith day of the week.

Country		Monday	Tuesday	*Wednesday*	Thursday	Friday	F-statistic	p-value
Estonia	coefficient	**-0.614** **	-0.378	***0.376*** *	-0.327	-0.447	1.129	0.341
	t-statistic	-2.048	-1.260	*1.777*	-1.091	-1.492		
	p-value	0.041	0.208	*0.076*	0.275	0.136		
Slovakia	coefficient	0.155	0.078	***-0.187*** *	0.159	0.224	0.661	0.619
	t-statistic	1.030	0.518	*-1.768*	1.061	1.497		
	p-value	0.303	0.604	*0.077*	0.289	0.135		
Slovenia	coefficient	**-0.236** **	**-0.357** ***	***0.141*** *	0.002	0.030	**4.658** ***	0.001
	t-statistic	-2.069	-3.134	*1.756*	0.017	0.263		
	p-value	0.039	0.002	*0.079*	0.987	0.793		

Thursday

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$, where the intercept, c, represents the Thursday and the coefficient α_i, $i = 2,\ldots, 5$, indicates the difference in returns between the Thursday and the ith day of the week.

Country		Monday	Tuesday	Wednesday	*Thursday*	Friday	F-statistic	p-value
Bulgaria	coefficient	**-1.562** *	**-1.551** *	**-1.669** *	***1.092*** *	-0.031	1.810	0.144
	t-statistic	-1.681	-1.714	-1.845	*1.706*	-0.034		
	p-value	0.100	0.094	0.072	*0.095*	0.973		
Hungary	coefficient	**0.566** **	0.328	**0.526** **	***-0.312*** *	**0.449** **	**1.990** *	0.094
	t-statistic	2.477	1.436	2.304	*-1.934*	1.966		
	p-value	0.013	0.151	0.021	*0.053*	0.050		
Latvia	coefficient	**0.479** *	**0.553** **	**0.481** *	***-0.466*** ***	**0.444** *	1.542	0.188
	t-statistic	1.892	2.184	1.900	*-2.601*	1.754		
	p-value	0.059	0.029	0.058	*0.009*	0.080		
Slovenia	coefficient	**-0.238** **	**-0.359** ***	-0.002	***0.143*** *	0.028	**4.658** ***	0.001
	t-statistic	-2.086	-3.150	-0.017	*1.780*	0.246		
	p-value	0.037	0.002	0.987	*0.075*	0.806		
MSCI Emerging Markets	coefficient	0.099	**0.234** *	0.183	***-0.209*** **	**0.265** **	1.587	0.175
	t-statistic	0.815	1.933	1.513	*-2.451*	2.196		
	p-value	0.416	0.053	0.131	*0.014*	0.028		

Friday

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$, where the intercept, c, represents the Friday and the coefficient α_i, $i = 2,\ldots, 5$, indicates the difference in returns between the Friday and the ith day of the week.

Country		Monday	Tuesday	Wednesday	Thursday	*Friday*	F-statistic	p-value
Slovenia	coefficient	**-0.266** **	**-0.387** ***	-0.030	-0.028	***0.171*** **	**4.658** ***	0.001
	t-statistic	-2.332	-3.396	-0.263	-0.246	*2.127*		
	p-value	0.020	0.001	0.793	0.806	*0.034*		

Table 10: Day-of-the-Week Effect during the Second Sub-Priod 2001-2004

Results for the regression $R_t = \alpha_1 D_{1t} + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$ are presented for the period 2001-2004. For each index the number the estimated coefficient, t-value and p-value are shown.

Country		Monday	Tuesday	Wednesday	Thursday	Friday	F-statistic	p-value
Bulgaria	coefficient	0.050	**0.269**	**0.342** **	-0.038	0.223	**2.168** **	0.056
	t-statistic	0.332	1.795	2.285	-0.253	1.490		
	p-value	0.740	0.073	0.023	0.800	0.136		
Croatia	coefficient	-0.135	0.080	0.042	0.155	0.129	1.258	0.280
	t-statistic	-1.308	0.772	0.407	1.502	1.250		
	p-value	0.191	0.440	0.684	0.133	0.212		
Czech Republic	coefficient	0.068	0.026	0.050	**0.191** **	0.033	1.359	0.237
	t-statistic	0.827	0.316	0.617	2.339	0.402		
	p-value	0.408	0.752	0.537	0.020	0.688		
Estonia	coefficient	0.030	**0.255** ***	**0.139** *	0.084	0.120	**3.104** ***	0.009
	t-statistic	0.368	3.074	1.675	1.008	1.452		
	p-value	0.713	0.002	0.094	0.313	0.147		
Hungary	coefficient	0.074	0.074	-0.104	**0.220** **	0.038	**1.889** *	0.094
	t-statistic	0.850	0.846	-1.194	2.527	0.440		
	p-value	0.396	0.398	0.233	0.012	0.660		
Latvia	coefficient	-0.079	0.099	-0.145	**0.284** **	0.115	1.420	0.214
	t-statistic	-0.580	0.725	-1.070	2.092	0.847		
	p-value	0.562	0.469	0.285	0.037	0.397		
Lithuania	coefficient	-0.074	0.030	0.053	**0.187** *	0.053	0.929	0.461
	t-statistic	-0.735	0.296	0.530	1.859	0.529		
	p-value	0.462	0.767	0.596	0.063	0.597		
Poland	coefficient	0.044	-0.022	-0.087	**0.138** *	0.118	1.331	0.249
	t-statistic	0.544	-0.274	-1.077	1.721	1.470		
	p-value	0.587	0.784	0.282	0.086	0.142		
Romania	coefficient	**0.162** *	**0.221** **	0.129	**0.304** ***	**0.180** **	**5.292** ***	<0.001
	t-statistic	1.789	2.442	1.426	3.362	1.989		
	p-value	0.074	0.015	0.154	0.001	0.047		
Russia	coefficient	**0.372** ***	**0.101** *	**-0.228** *	**0.272**	0.179	**3.384** ***	0.005
	t-statistic	2.763	0.749	-1.693	2.020	1.332		
	p-value	0.006	0.454	0.091	0.044	0.183		
Slovakia	coefficient	-0.014	0.074	**0.144** *	**0.172**	**0.236** ***	**3.041** **	0.010
	t-statistic	-0.168	0.859	1.678	2.011	2.753		
	p-value	0.866	0.391	0.094	0.045	0.006		
Slovenia	coefficient	**0.127** **	-0.056	0.074	**0.124**	**0.154** **	**3.384** ***	0.005
	t-statistic	2.069	-0.909	1.207	2.018	2.507		
	p-value	0.039	0.363	0.228	0.044	0.012		
MSCI Europe	coefficient	-0.022	-0.068	-0.102	**0.156** *	0.031	1.034	0.396
	t-statistic	-0.252	-0.760	-1.149	1.756	0.353		
	p-value	0.801	0.448	0.251	0.079	0.725		
MSCI World	coefficient	-0.036	-0.031	-0.002	0.087	-0.039	0.494	0.781
	t-statistic	-0.530	-0.456	-0.024	1.283	-0.580		
	p-value	0.596	0.649	0.981	0.200	0.562		
MSCI Emerging Markets	coefficient	-0.021	0.066	0.017	0.068	0.090	0.759	0.580
	t-statistic	-0.305	0.959	0.243	0.994	1.317		
	p-value	0.760	0.338	0.808	0.320	0.188		

Notes: ***, **, and * indicate statistical significance for a two-tailed t-test at the one, five and ten percent level respectively.

Table 11: Tests for the Explicit Day-of-the-Week Patterns for the Second Sub-Period 2001-2004

Monday

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$, where the intercept, c, represents the Monday and the coefficient α_i, $i = 2,\ldots, 5$, indicates the difference in returns between the Monday and the ith day of the week.

Country		*Monday*	Tuesday	Wednesday	Thursday	Friday	F-statistic	p-value
Czech Republic	coefficient	*0.068*	-0.042	-0.017	0.123	-0.035	0.686	0.602
	t-statistic	*0.827*	-0.362	-0.148	1.069	-0.301		
	p-value	*0.408*	0.718	0.882	0.285	0.764		
Romania	coefficient	*0.162*	0.059	-0.033	0.142	0.018	0.555	0.695
	t-statistic	*1.789*	0.462	-0.257	1.112	0.141		
	p-value	*0.074*	0.644	0.797	0.266	0.888		
Russia	coefficient	***0.372*** ***	-0.271	**-0.600** ***	-0.100	-0.193	**2.893** **	0.021
	t-statistic	*2.763*	-1.425	-3.151	-0.526	-1.012		
	p-value	*0.006*	0.155	0.002	0.599	0.312		
Slovenia	coefficient	***0.127*** **	**-0.182** **	-0.053	-0.003	0.027	1.855	0.116
	t-statistic	*2.069*	-2.106	-0.610	-0.036	0.310		
	p-value	*0.039*	0.035	0.542	0.971	0.757		

Tuesday

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$, where the intercept, c, represents the Tuesday and the coefficient α_i, $i = 2,\ldots, 5$, indicates the difference in returns between the Tuesday and the ith day of the week.

Country		Monday	*Tuesday*	Wednesday	Thursday	Friday	F-statistic	p-value
Bulgaria	coefficient	-0.219	***0.269*** *	0.073	-0.307	-0.046	1.114	0.349
	t-statistic	-1.034	*1.795*	0.346	-1.448	-0.215		
	p-value	0.301	*0.073*	0.729	0.148	0.830		
Estonia	coefficient	-0.224	***0.255*** ***	-0.116	-0.171	-0.134	1.009	0.402
	t-statistic	-1.914	*3.074*	-0.989	-1.461	-1.147		
	p-value	0.056	*0.002*	0.323	0.144	0.252		
Romania	coefficient	-0.059	***0.221*** **	-0.092	0.083	-0.041	0.555	0.695
	t-statistic	-0.462	*2.442*	-0.719	0.651	-0.320		
	p-value	0.644	*0.015*	0.473	0.515	0.749		

Wednesday

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$, where the intercept, c, represents the Wednesday and the coefficient α_i, $i = 2,\ldots, 5$, indicates the difference in returns between the Wednesday and the ith day of the week.

Country		Monday	Tuesday	*Wednesday*	Thursday	Friday	F-statistic	p-value
Bulgaria	coefficient	-0.292	-0.073	***0.342*** **	**-0.380** *	-0.119	1.114	0.349
	t-statistic	-1.380	-0.346	*2.285*	-1.794	-0.562		
	p-value	0.168	0.729	*0.023*	0.073	0.574		
Estonia	coefficient	-0.108	0.116	*0.139*	-0.055	-0.018	1.009	0.402
	t-statistic	-0.925	0.989	*1.675*	-0.472	-0.158		
	p-value	0.355	0.323	*0.094*	0.637	0.875		
Russia	coefficient	**0.600** ***	0.329	***-0.228*** *	**0.500** ***	**0.407** **	**2.893** **	0.021
	t-statistic	3.151	1.727	*-1.693*	2.626	2.140		
	p-value	0.002	0.085	*0.091*	0.009	0.033		

Thursday

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$, where the intercept, c, represents the Thursday and the coefficient α_i, $i = 2,\ldots, 5$, indicates the difference in returns between the Thursday and the ith day of the week.

Country		Monday	Tuesday	Wednesday	*Thursday*	Friday	F-statistic	p-value
Croatia	coefficient	-0.123	-0.165	-0.141	***0.191*** **	-0.158	0.686	0.602
	t-statistic	-1.069	-1.430	-1.217	*2.339*	-1.369		
	p-value	0.285	0.153	0.224	*0.020*	0.171		
Hungary	coefficient	-0.146	-0.146	**-0.323** ***	***0.220*** **	-0.181	1.759	0.135
	t-statistic	-1.186	-1.189	-2.631	*2.527*	-1.476		
	p-value	0.236	0.235	0.009	*0.012*	0.140		
Latvia	coefficient	-0.363	-0.186	**-0.430** **	***0.284*** **	-0.169	1.572	0.180
	t-statistic	-1.889	-0.966	-2.235	*2.092*	-0.880		
	p-value	0.059	0.334	0.026	*0.037*	0.379		
Lithuania	coefficient	-0.260	-0.157	-0.133	***0.187*** *	-0.133	0.854	0.491
	t-statistic	-1.834	-1.105	-0.940	*1.859*	-0.940		
	p-value	0.067	0.270	0.348	*0.063*	0.347		
Poland	coefficient	-0.095	-0.160	**-0.225** **	***0.138*** *	-0.020	1.379	0.239
	t-statistic	-0.832	-1.410	-1.978	*1.721*	-0.177		
	p-value	0.405	0.159	0.048	*0.086*	0.860		
Romania	coefficient	-0.142	-0.083	-0.175	***0.304*** ***	-0.124	0.555	0.695
	t-statistic	-1.112	-0.651	-1.369	*3.362*	-0.971		
	p-value	0.266	0.515	0.171	*0.001*	0.332		
Russia	coefficient	0.100	-0.171	**-0.500** ***	***0.272*** **	-0.093	**2.893** **	0.021
	t-statistic	0.526	-0.899	-2.626	*2.020*	-0.486		
	p-value	0.599	0.369	0.009	*0.044*	0.627		
Slovakia	coefficient	-0.187	-0.099	-0.029	***0.172*** **	0.064	1.258	0.285
	t-statistic	-1.541	-0.814	-0.235	*2.011*	0.525		
	p-value	0.124	0.416	0.814	*0.045*	0.600		
Slovenia	coefficient	0.003	**-0.179** **	-0.050	***0.124*** **	0.030	1.855	0.116
	t-statistic	0.036	-2.070	-0.574	*2.018*	0.346		
	p-value	0.971	0.039	0.566	*0.044*	0.729		
MSCI Europe	coefficient	-0.179	**-0.224** *	**-0.259** **	***0.156*** *	-0.125	1.292	0.271
	t-statistic	-1.420	-1.779	-2.054	*1.756*	-0.992		
	p-value	0.156	0.076	0.040	*0.079*	0.321		

Friday

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$, where the intercept, c, represents the Friday and the coefficient α_i, $i = 2,\ldots, 5$, indicates the difference in returns between the Friday and the ith day of the week.

Country		Monday	Tuesday	Wednesday	Thursday	*Friday*	F-statistic	p-value
Romania	coefficient	-0.018	0.041	-0.051	0.124	***0.180*** **	0.555	0.695
	t-statistic	-0.141	0.320	-0.398	0.971	*1.989*		
	p-value	0.888	0.749	0.691	0.332	*0.047*		
Slovakia	coefficient	**-0.250** **	-0.162	-0.092	-0.064	***0.236*** ***	1.258	0.285
	t-statistic	-2.066	-1.339	-0.760	-0.525	*2.753*		
	p-value	0.039	0.181	0.447	0.600	*0.006*		
Slovenia	coefficient	-0.027	**-0.209** **	-0.080	-0.030	***0.154*** **	1.855	0.116
	t-statistic	-0.310	-2.416	-0.920	-0.346	*2.507*		
	p-value	0.757	0.016	0.358	0.729	*0.012*		

Table 12: Day-of-the-Week Effect during the Third Sub-Period 2005-2008

Results for the regression $R_t = \alpha_1 D_{1t} + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$ are presented for the period 2005-2008. For each index the estimated coefficient, t-value and p-value are shown.

Country		Monday	Tuesday	Wednesday	Thursday	Friday	F-statistic	p-value
Bulgaria	Coefficient	0.063	-0.103	**0.165** *	0.108	**0.267** **	**3.395** ***	0.005
	t-statistic	0.733	-1.197	1.925	1.262	3.116		
	p-value	0.463	0.232	0.055	0.207	0.002		
Croatia	Coefficient	-0.010	**0.226** ***	0.109	**0.155** *	0.123	**3.076** ***	0.009
	t-statistic	-0.123	2.772	1.335	1.904	1.508		
	p-value	0.902	0.006	0.182	0.057	0.132		
Czech Republic	Coefficient	0.058	0.052	-0.063	0.124	0.082	0.729	0.602
	t-statistic	0.612	0.558	-0.672	1.324	0.869		
	p-value	0.540	0.577	0.502	0.186	0.385		
Estonia	Coefficient	**-0.191** **	0.041	-0.008	0.090	0.107	1.642	0.146
	t-statistic	-2.276	0.491	-0.097	1.074	1.275		
	p-value	0.023	0.623	0.923	0.283	0.203		
Hungary	Coefficient	0.119	0.046	-0.127	0.055	**0.189** *	1.202	0.307
	t-statistic	1.094	0.420	-1.164	0.508	1.738		
	p-value	0.274	0.675	0.245	0.612	0.083		
Latvia	Coefficient	0.120	-0.030	-0.141	**0.224** *	**0.311** *	**2.076** *	0.066
	t-statistic	0.906	-0.223	-1.064	1.689	2.351		
	p-value	0.365	0.824	0.288	0.092	0.019		
Lithuania	Coefficient	0.033	0.016	-0.158	0.131	**0.288** **	**2.519** **	0.028
	t-statistic	0.329	0.163	-1.580	1.306	2.874		
	p-value	0.742	0.871	0.115	0.192	0.004		
Poland	Coefficient	0.076	0.022	0.040	0.083	0.130	0.688	0.633
	t-statistic	0.790	0.231	0.421	0.869	1.352		
	p-value	0.430	0.818	0.674	0.385	0.177		
Romania	Coefficient	-0.061	0.148	-0.019	0.073	0.183	0.801	0.549
	t-statistic	-0.479	1.164	-0.153	0.575	1.437		
	p-value	0.632	0.245	0.878	0.566	0.151		
Russia	Coefficient	0.088	-0.008	0.060	**0.228** *	**0.367** **	**2.545** **	0.027
	t-statistic	0.701	-0.067	0.477	1.830	2.942		
	p-value	0.483	0.946	0.633	0.068	0.003		
Slovakia	Coefficient	0.042	-0.002	0.033	0.062	0.051	0.357	0.878
	t-statistic	0.581	-0.021	0.461	0.861	0.704		
	p-value	0.561	0.983	0.645	0.390	0.482		
Slovenia	Coefficient	-0.080	-0.020	0.076	**0.246** ***	**0.213** **	**5.318** ***	<0.001
	t-statistic	-1.203	-0.302	1.138	3.690	3.184		
	p-value	0.229	0.763	0.255	<0.001	0.002		
MSCI Europe	Coefficient	-0.038	0.047	0.059	0.061	0.070	0.487	0.786
	t-statistic	-0.466	0.578	0.736	0.762	0.871		
	p-value	0.641	0.564	0.462	0.446	0.384		
MSCI World	Coefficient	0.005	-0.010	0.079	0.040	0.018	0.570	0.723
	t-statistic	0.099	-0.193	1.463	0.739	0.336		
	p-value	0.921	0.847	0.144	0.460	0.737		
MSCI Emerging M	Coefficient	0.045	0.003	0.086	**0.154** *	**0.173** **	1.644	0.146
	t-statistic	0.515	0.033	0.979	1.759	1.975		
	p-value	0.607	0.974	0.328	0.079	0.049		

Notes: ***, **, and * indicate statistical significance for a two-tailed t-test at the one, five and ten percent level respectively.

Table 13: Tests for the Explicit Day-of-the-Week Patterns for the Third Sub-Period 2005-2008

Monday

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$, where the intercept, c, represents the Monday and the coefficient α_i, $i = 2,\ldots, 5$, indicates the difference in returns between the Monday and the ith day of the week.

Country		Monday	Tuesday	Wednesday	Thursday	Friday	F-statistic	p-value
Estonia	coefficient	**-0.191** **	**0.233** *	0.183	**0.282** **	**0.299** **	**2.042** *	0.087
	t-statistic	-2.276	1.957	1.541	2.369	2.511		
	p-value	0.023	0.051	0.124	0.018	0.012		

Tuesday

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$, where the intercept, c, represents the Tuesday and the coefficient α_i, $i = 2,\ldots, 5$, indicates the difference in returns between the Tuesday and the ith day of the week.

Country		Monday	Tuesday	Wednesday	Thursday	Friday	F-statistic	p-value
Croatia	coefficient	**-0.236** **	**0.226** ***	-0.117	-0.071	-0.103	1.110	0.350
	t-statistic	-2.047	2.772	-1.016	-0.614	0.539		
	p-value	0.041	0.006	0.310	-0.894	0.371		

Wednesday

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$, where the intercept, c, represents the Wednesday and the coefficient α_i, $i = 2,\ldots, 5$, indicates the difference in returns between the Wednesday and the ith day of the week.

Country		Monday	Tuesday	Wednesday	Thursday	Friday	F-statistic	p-value
Bulgaria	coefficient	-0.183	-0.008	-0.008	0.098	0.115	**2.539** **	0.039
	t-statistic	-1.541	0.416	-0.097	0.828	0.970		
	p-value	0.124	0.677	0.923	0.408	0.332		

Thursday

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$, where the intercept, c, represents the Thursday and the coefficient α_i, $i = 2,\ldots, 5$, indicates the difference in returns between the Thursday and the ith day of the week.

Country		Monday	Tuesday	Wednesday	Thursday	Friday	F-statistic	p-value
Croatia	coefficient	-0.165	0.071	-0.046	**0.155** *	-0.032	1.110	0.350
	t-statistic	-1.433	0.614	-0.402	1.904	-0.280		
	p-value	0.152	0.539	0.688	0.057	0.779		
Latvia	coefficient	-0.104	-0.253	**-0.364** *	**0.224** *	0.088	1.926	0.104
	t-statistic	-0.554	-1.352	-1.947	1.689	0.468		
	p-value	0.580	0.177	0.052	0.092	0.640		
Russia	coefficient	-0.141	-0.237	-0.169	0.228 *	0.139	1.451	0.215
	t-statistic	-0.798	-1.341	-0.956	1.830	0.786		
	p-value	0.425	0.180	0.339	0.068	0.432		
Slovenia	coefficient	**-0.327** ***	**-0.267** ***	**-0.170** *	**0.246** ***	-0.034	**4.530** ***	0.001
	t-statistic	-3.460	-2.823	-1.805	3.690	-0.358		
	p-value	0.001	0.005	0.071	<0.001	0.720		
MSCI Emerging Markets	coefficient	-0.109	-0.152	-0.069	**0.154** *	0.019	0.671	0.612
	t-statistic	-0.880	-1.221	-0.552	1.759	0.152		
	p-value	0.379	0.222	0.581	0.079	0.879		

Friday

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \alpha_5 D_{5t} + e_t$, where the intercept, c, represents the Friday and the coefficient α_i, $i = 2,\ldots, 5$, indicates the difference in returns between the Friday and the ith day of the week.

Country		Monday	Tuesday	Wednesday	Thursday	Friday	F-statistic	p-value
Bulgaria	coefficient	**-0.204** *	**-0.370** ***	-0.102	-0.159	**0.267** ***	**2.539** **	0.039
	t-statistic	-1.685	-3.050	-0.843	-1.311	3.116		
	p-value	0.092	0.002	0.400	0.190	0.002		
Hungary	coefficient	-0.070	-0.144	**-0.316** **	-0.134	**0.189** *	1.165	0.3249
	t-statistic	-0.456	-0.932	-2.052	-0.870	1.738		
	p-value	0.649	0.352	0.040	0.384	0.083		
Latvia	coefficient	-0.191	**-0.341** *	**-0.452** **	-0.088	**0.311** **	1.926	0.104
	t-statistic	-1.021	-1.820	-2.415	-0.468	2.351		
	p-value	0.307	0.069	0.016	0.640	0.019		
Lithuania	coefficient	**-0.255** *	**-0.272** *	**-0.447** ***	-0.157	**0.288** ***	**2.671** **	0.031
	t-statistic	-1.800	-1.917	-3.149	-1.109	2.874		
	p-value	0.072	0.056	0.002	0.268	0.004		
Russia	coefficient	-0.280	**-0.376** **	**-0.308** *	-0.139	**0.367** ***	1.451	0.215
	t-statistic	-1.584	-2.128	-1.742	-0.786	2.942		
	p-value	0.114	0.034	0.082	0.432	0.003		
Slovenia	coefficient	**-0.293** ***	**-0.233** **	-0.137	0.034	**0.213** ***	**4.530** ***	0.001
	t-statistic	-3.102	-2.465	-1.447	0.358	3.184		
	p-value	0.002	0.014	0.148	0.720	0.002		
MSCI Emerging Markets	coefficient	-0.128	-0.170	-0.087	-0.019	**0.173** **	0.671	0.612
	t-statistic	-1.032	-1.373	-0.704	-0.152	1.975		
	p-value	0.302	0.170	0.482	0.879	0.049		

Annex 2: Tests for the Month-of-the-Year Effect

Table 14: Test for the Monthly Effect during the Whole Sample Period 1997-2008

Results for the regression $R_t = \alpha_1 D_{1t} + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \ldots + \alpha_{12} D_{12t} + e_{t\,t}$ are presented for the period 1997-2008. For each index the number of observations (N) and the estimated coefficient, t-value and p-value are shown.

Country	N		January	February	March	April	May	June	July	August	September	October	November	December	F-statistic	p-value
Bulgaria	88	coefficient	2.391	**5.445** *	**-3.650** *	1.859	-0.580	**6.889** **	**7.124** **	2.693	**6.333** *	3.826	2.106	2.778	**2.140** **	0.024
		t-statistic	0.852	1.941	-1.217	0.620	-0.193	2.297	2.375	0.898	2.112	1.275	0.702	0.990		
		p-value	0.397	0.056	0.227	0.537	0.847	0.024	0.020	0.372	0.038	0.206	0.485	0.325		
Croatia	134	coefficient	**6.319** **	0.545	1.381	0.890	-1.147	0.512	1.438	-3.180	1.435	1.184	**4.826** *	3.148	0.973	0.479
		t-statistic	2.292	0.198	0.480	0.309	-0.398	0.178	0.476	-1.104	0.498	0.411	1.676	1.093		
		p-value	0.024	0.844	0.632	0.758	0.691	0.859	0.635	0.272	0.619	0.682	0.096	0.277		
Czech Republic	134	coefficient	1.581	1.396	1.729	-0.015	-0.295	-2.157	2.466	-0.396	-1.070	2.615	-1.947	**3.603** *	0.850	0.599
		t-statistic	0.804	0.710	0.842	-0.007	-0.144	-1.050	1.145	-0.193	-0.521	1.274	-0.948	1.755		
		p-value	0.423	0.479	0.401	0.994	0.886	0.296	0.254	0.847	0.603	0.205	0.345	0.082		
Estonia	134	coefficient	4.164	3.614	**6.152** *	0.237	-5.267	-2.021	4.056	**5.566** *	**-6.276** *	-1.896	-0.855	4.611	**1.693** *	0.076
		t-statistic	1.341	1.163	1.896	0.073	-1.624	-0.623	1.192	1.716	-1.935	-0.584	-0.264	1.421		
		p-value	0.183	0.247	0.060	0.942	0.107	0.534	0.236	0.089	0.055	0.560	0.793	0.158		
Hungary	134	coefficient	3.965	-0.409	-0.433	3.133	-1.616	0.601	3.034	-2.868	-1.951	2.755	-0.305	**6.392** **	1.207	0.286
		t-statistic	1.582	-0.163	-0.165	1.197	-0.617	0.230	1.105	-1.096	-0.745	1.053	-0.117	2.442		
		p-value	0.116	0.871	0.869	0.234	0.538	0.819	0.271	0.275	0.458	0.295	0.907	0.016		
Latvia	122	coefficient	2.161	-0.030	0.723	1.943	-4.454	-0.411	4.314	0.029	-1.077	0.305	1.994	1.630	0.516	0.901
		t-statistic	0.734	-0.011	0.246	0.660	-1.513	-0.140	1.390	0.010	-0.366	0.104	0.678	0.554		
		p-value	0.464	0.991	0.806	0.510	0.133	0.889	0.167	0.992	0.715	0.918	0.499	0.581		
Lithuania	122	coefficient	**4.323** *	3.426	1.811	1.967	-3.270	2.057	2.690	-1.281	0.370	-3.385	-0.104	2.561	0.983	0.470
		t-statistic	1.660	1.380	0.695	0.755	-1.256	0.790	0.980	-0.492	0.142	-1.299	-0.040	0.983		
		p-value	0.100	0.171	0.488	0.452	0.212	0.431	0.329	0.624	0.887	0.197	0.968	0.328		
Poland	134	coefficient	2.965	0.442	-0.045	1.934	-0.469	0.048	1.435	-0.832	-2.349	2.648	-0.925	3.553	0.658	0.788
		t-statistic	1.337	0.199	-0.019	0.835	-0.202	0.021	0.591	-0.359	-1.014	1.143	-0.399	1.534		
		p-value	0.184	0.842	0.985	0.405	0.840	0.983	0.556	0.720	0.313	0.255	0.690	0.128		
Romania	134	coefficient	**6.954** **	1.596	-3.955	0.465	1.380	4.775	3.572	-2.217	0.517	3.167	-1.698	2.812	0.991	0.462
		t-statistic	2.163	0.497	-1.173	0.138	0.409	1.416	1.005	-0.658	0.153	0.939	-0.528	0.875		
		p-value	0.033	0.620	0.243	0.891	0.683	0.159	0.317	0.512	0.878	0.350	0.598	0.384		
Russia	134	coefficient	1.636	7.165	4.255	4.486	-4.918	3.134	0.796	-3.323	-5.104	3.022	-0.344	**8.121** *	0.949	0.501
		t-statistic	0.369	1.617	0.919	0.969	-1.063	0.677	0.164	-0.718	-1.103	0.653	-0.074	1.754		
		p-value	0.713	0.109	0.360	0.334	0.290	0.500	0.870	0.474	0.272	0.515	0.941	0.082		
Slovakia	134	coefficient	-1.389	1.978	-0.557	-2.075	-2.197	-0.026	3.102	3.907	0.288	0.706	1.787	2.704	1.114	0.355
		t-statistic	-0.743	1.059	-0.286	-1.063	-1.126	-0.013	1.516	**2.002** **	0.148	0.362	0.916	1.386		
		p-value	0.459	0.292	0.776	0.290	0.262	0.990	0.132	0.048	0.883	0.718	0.362	0.168		
Slovenia	134	coefficient	**5.038** ***	-2.186	0.255	2.534	0.383	-0.534	**5.003** ***	**3.318** **	0.645	0.378	0.316	1.714	**2.617** ***	0.004
		t-statistic	3.356	-1.456	0.163	1.616	0.244	-0.341	3.043	2.117	0.411	0.241	0.202	1.093		
		p-value	0.001	0.148	0.871	0.109	0.807	0.734	0.003	0.036	0.682	0.810	0.841	0.276		
MSCI Europe	134	coefficient	-1.701	-0.364	0.390	1.909	-0.577	0.157	-1.055	-0.915	-1.688	**2.788** **	1.743	**3.391** **	1.594	0.102
		t-statistic	-1.324	-0.283	0.291	1.422	-0.430	0.117	-0.749	-0.681	-1.258	2.077	1.299	2.526		
		p-value	0.188	0.777	0.772	0.158	0.668	0.907	0.455	0.497	0.211	0.040	0.196	0.013		
MSCI World	134	coefficient	-0.636	-0.920	0.468	1.414	-0.258	0.477	-1.256	-1.175	-1.449	**2.101** *	1.495	1.719	1.062	0.398
		t-statistic	-0.553	-0.800	0.389	1.177	-0.214	0.397	-0.997	-0.978	-1.206	1.749	1.244	1.431		
		p-value	0.581	0.426	0.698	0.242	0.831	0.692	0.321	0.330	0.230	0.083	0.216	0.155		
MSCI Emerging Markets	134	coefficient	0.369	1.171	-0.345	0.776	-2.031	0.640	-0.950	-2.605	-1.368	1.500	2.267	3.274	0.617	0.825
		t-statistic	0.179	0.566	-0.160	0.360	-0.941	0.297	-0.420	-1.207	-0.634	0.695	1.050	1.517		
		p-value	0.858	0.572	0.873	0.720	0.349	0.767	0.675	0.230	0.527	0.489	0.296	0.132		

Notes: ***, **, and * indicate statistical significance for a two-tailed t-test at the one, five and ten percent level respectively.

Table 15: Tests for the Explicit Month-of-the-Year Patterns for the Whole Sample Period 1997-2008

January

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for January and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between January and the ith month of the year.

Country		*January*	February	March	April	May	June	July	August	September	October	November	December	F-statistic	p-value
Croatia	coefficient	***6.319*** **	-5.774	-4.939	-5.429	**-7.466** *	-5.808	-5.564	**-9.499** **	-4.884	-5.135	-1.493	-3.172	0.781	0.659
	t-statistic	*2.296*	-1.484	-1.241	-1.364	-1.876	-1.459	-1.398	-2.387	-1.227	-1.290	-0.375	-0.797		
	p-value	*0.023*	0.140	0.217	0.175	0.063	0.147	0.165	0.019	0.222	0.199	0.708	0.427		
Lithuania	coefficient	***4.323*** *	-0.897	-2.512	-2.356	**-7.593** **	-2.265	-1.985	-5.604	-3.953	**-7.707** **	-4.426	-1.762	0.927	0.517
	t-statistic	*1.666*	-0.250	-0.684	-0.642	-2.069	-0.617	-0.541	-1.527	-1.077	-2.100	-1.206	-0.480		
	p-value	*0.099*	0.803	0.495	0.522	0.041	0.538	0.590	0.130	0.284	0.038	0.230	0.632		
Romania	coefficient	***6.954*** **	-5.357	**-10.909** **	-6.489	-5.574	-2.179	-4.580	**-9.171** *	-6.437	-3.787	**-8.652** *	-4.142	0.844	0.597
	t-statistic	*2.162*	-1.178	-2.341	-1.392	-1.196	-0.467	-0.983	-1.968	-1.381	-0.812	-1.902	-0.911		
	p-value	*0.033*	0.241	0.021	0.167	0.234	0.641	0.328	0.052	0.170	0.418	**0.060** **	0.364		
Slovenia	coefficient	***5.038*** ***	**-7.224** ***	**-4.783** **	-2.504	**-4.655** **	-5.572	-0.087	-1.720	**-4.393** **	-4.660	-4.722	-3.324	**2.052** **	0.029
	t-statistic	*3.370*	-3.417	-2.213	-1.159	-2.154	-2.578	-0.040	-0.796	-2.032	-2.156	-2.184	-1.538		
	p-value	*0.001*	0.001	0.029	0.249	0.033	0.011	0.968	0.428	0.044	0.033	0.031	0.127		

February

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for February and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between February and the ith month of the year.

Country		January	*February*	March	April	May	June	July	August	September	October	November	December	F-statistic	p-value
Bulgaria	coefficient	-3.054	***5.445*** *	**-9.095** **	-3.586	-6.025	1.444	1.679	-2.752	0.888	-1.620	-3.339	-2.668	1.115	0.362
	t-statistic	-0.770	*1.941*	-2.215	-0.873	-1.467	0.351	0.409	-0.670	0.216	-0.394	-0.813	-0.672		
	p-value	0.444	*0.056*	0.030	0.385	0.147	0.726	0.684	0.505	0.829	0.694	0.419	0.503		

March

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for March and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between March and the ith month of the year.

Country		January	February	*March*	April	May	June	July	August	September	October	November	December	F-statistic	p-value
Estonia	coefficient	-1.988	-2.538	***6.152*** *	-5.914	**-11.419** **	**-8.173** *	-2.037	-0.586	**-12.428** ***	**-8.048** *	-7.006	-1.541	**1.761** *	0.068
	t-statistic	-0.444	-0.567	*1.904*	-1.294	-2.499	-1.789	-0.446	-0.128	-2.720	-1.761	-1.533	-0.337		
	p-value	0.658	0.571	*0.059*	0.198	0.014	0.076	0.656	0.898	0.007	0.081	0.128	0.737		

June

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for June and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between June and the ith month of the year.

Country		January	February	March	April	May	*June*	July	August	September	October	November	December	F-statistic	p-value
Bulgaria	coefficient	-4.498	-1.444	**-10.539** **	-5.030	**-7.468** *	***6.889*** **	0.235	-4.196	-0.556	-3.063	-4.783	-4.111	1.115	0.362
	t-statistic	-1.095	-0.351	-2.485	-1.186	-1.761	*2.297*	0.055	-0.989	-0.131	-0.722	-1.128	-1.001		
	p-value	0.277	0.726	0.015	0.239	0.082	*0.024*	0.956	0.326	0.896	0.472	0.263	0.320		

July

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for July and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between July and the ith month of the year.

Country		January	February	March	April	May	June	*July*	August	September	October	November	December	F-statistic	p-value
Bulgaria	coefficient	-4.733	-1.679	**-10.774** **	-5.265	**-7.704** *	-0.235	***7.124*** **	-4.431	-0.791	-3.298	-5.018	-4.346	1.115	0.362
	t-statistic	-1.152	-0.409	-2.540	-1.241	-1.816	-0.055	*2.375*	-1.045	-0.186	-0.778	-1.183	-1.058		
	p-value	0.253	0.684	0.013	0.218	0.073	0.956	*0.020*	0.300	0.853	**0.439** **	0.241	0.293		
Slovenia	coefficient	0.087	**-7.136** ***	**-4.696** **	-2.417	**-4.568** **	**-5.485** **	***4.951*** ***	-1.633	**-4.306** *	-4.572	**-4.635** **	-3.237	**2.052** **	0.029
	t-statistic	0.040	-3.302	-2.127	-1.095	-2.069	-2.484	*3.171*	-0.739	-1.950	-2.071	-2.099	-1.466		
	p-value	0.968	0.001	0.035	0.276	0.041	0.014	*0.002*	0.461	0.053	0.040	0.038	0.145		

August

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for August and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between August and the ith month of the year.

Country		January	February	March	April	May	June	July	*August*	September	October	November	December	F-statistic	p-value
Estonia	coefficient	-1.402	-1.952	0.586	-5.329	**-10.833** **	**-7.587** *	-1.452	***5.566*** *	**-11.842** **	-7.462	-6.421	-0.955	**1.761** *	0.068
	t-statistic	-0.313	-0.436	0.128	-1.166	-2.371	-1.660	-0.318	*1.723*	-2.592	-1.633	-1.405	-0.209		
	p-value	0.754	0.663	0.898	0.246	0.019	0.099	0.751	*0.087*	0.011	0.105	0.162	0.835		
Slovakia	coefficient	**-5.296** *	-1.929	-4.464	-5.982	**-6.104** **	-3.932	-1.180	***3.907*** **	-3.619	-3.201	-2.120	-1.203	1.067	0.393
	t-statistic	-1.965	-0.716	-1.622	-2.173	-2.217	-1.429	-0.429	*2.007*	-1.315	-1.163	-0.770	-0.437		
	p-value	0.052	0.475	0.107	0.032	0.028	0.156	0.669	*0.047*	0.191	0.247	0.443	0.663		
Slovenia	coefficient	1.720	**-5.504** **	-3.063	-0.785	-2.935	**-3.852** *	1.633	***3.318*** **	-2.673	-2.940	-3.002	-1.604	**2.052** **	0.029
	t-statistic	0.796	-2.546	-1.387	-0.355	-1.329	-1.745	0.739	*2.125*	-1.211	-1.331	-1.360	-0.726		
	p-value	0.428	0.012	0.168	0.723	0.186	0.084	0.461	*0.036*	0.228	0.186	0.176	0.469		

September

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for September and the coefficient α_i, $i = 2,..., 12$, indicates the difference in return between September and the ith month of the year.

Country		January	February	March	April	May	June	July	August	*September*	October	November	December	F-statistic	p-value
Bulgaria	coefficient	-3.942	-0.888	**-9.983** **	-4.474	-6.913	0.556	0.791	-3.640	***6.333*** **	-2.508	-4.227	-3.556	1.115	0.362
	t-statistic	-0.960	-0.216	-2.354	-1.055	-1.630	0.131	0.186	-0.858	*2.112*	-0.591	-0.997	-0.866		
	p-value	0.340	0.829	0.021	0.295	0.107	0.896	0.853	0.394	*0.038*	0.556	0.322	0.389		
Estonia	coefficient	**10.440** **	**9.890** **	**12.428** ***	6.514	1.009	4.255	**10.391** **	**11.842** **	***-6.276*** *	4.380	5.421	**10.887** **	**1.761** *	0.068
	t-statistic	2.334	2.211	2.720	1.426	0.221	0.931	2.274	2.592	*-1.943*	0.959	1.187	2.383		
	p-value	0.021	0.029	0.007	0.157	0.826	0.354	0.025	0.011	*0.054*	0.340	0.238	0.019		

October

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for October and the coefficient α_i, $i = 2,..., 12$, indicates the difference in return between October and the ith month of the year.

Country		January	February	March	April	May	June	July	August	September	*October*	November	December	F-statistic	p-value
MSCIEurope	coefficient	**-4.489** **	**-3.152** *	-2.398	-0.879	**-3.366** *	-2.631	**-3.843** **	**-3.703** *	**-4.477** **	***2.788*** **	-1.045	0.603	**1.695** *	0.082
	t-statistic	-2.426	-1.703	-1.269	-0.465	-1.780	-1.392	-2.033	-1.959	-2.368	*2.086*	-0.553	0.319		
	p-value	0.017	0.091	0.207	0.643	0.078	0.167	0.044	0.052	0.019	*0.039*	0.582	0.750		
MSCI World	coefficient	-2.738	**-3.021** *	-1.634	-0.688	-2.359	-1.624	**-3.389** **	**-3.276** *	**-3.550** **	***2.101*** *	-0.607	-0.382	1.166	0.318
	t-statistic	-1.653	-1.824	-0.966	-0.406	-1.394	-0.960	-2.003	-1.936	-2.098	*1.756*	-0.359	-0.226		
	p-value	0.101	0.071	0.336	0.685	0.166	0.339	0.047	0.055	0.038	*0.082*	0.721	0.822		

November

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for November and the coefficient α_i, $i = 2,..., 12$, indicates the difference in return between November and the ith month of the year.

Country		January	February	March	April	May	June	July	August	September	October	*November*	December	F-statistic	p-value
Croatia	coefficient	1.493	-4.281	-3.445	-3.936	-5.973	-4.314	-4.070	**-8.006** *	-3.391	-3.642	***4.826*** *	-1.678	0.781	0.659
	t-statistic	0.375	-1.076	-0.847	-0.968	-1.469	-1.061	-1.001	-1.969	-0.834	-0.896	*1.679*	-0.413		
	p-value	0.708	0.284	0.398	0.335	0.144	0.291	0.319	0.051	0.406	0.372	*0.096*	0.680		

December

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for December and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between December and the ith month of the year.

Country		January	February	March	April	May	June	July	August	September	October	November	*December*	F-statistic	p-value
Czech Republic	coefficient	-2.022	-2.207	-1.874	-3.618	-3.898	**-5.760** **	-0.898	-3.999	-4.673	-0.988	**-5.551** *	*0.859*	0.859	0.583
	t-statistic	-0.714	-0.779	-0.648	-1.250	-1.347	-1.991	-0.310	-1.382	-1.615	-0.342	-1.918	*0.583*		
	p-value	0.477	0.437	0.518	0.214	0.180	0.049	0.757	0.169	0.109	0.733	0.057	*0.680*		
Hungary	coefficient	-2.428	**-6.801** *	-6.825	-3.260	**-8.008** **	-5.791	-2.737	**-9.260** **	**-8.343** **	-3.637	**-6.698** *	***6.392*** **	1.196	0.297
	t-statistic	-0.671	-1.880	-1.847	-0.882	-2.167	-1.567	-0.741	-2.506	-2.258	-0.984	-1.813	*2.446*		
	p-value	0.503	0.062	0.067	0.379	0.032	0.120	0.460	0.014	0.026	0.327	0.072	*0.016*		
Russia	coefficient	-6.484	-0.956	-3.866	-3.634	**-13.039** **	-4.987	-8.498	**-11.443** *	**-13.225** **	-5.098	-8.464	***8.121*** *	0.916	0.527
	t-statistic	-1.013	-0.149	-0.591	-0.556	-1.995	-0.763	-1.300	-1.751	-2.023	-0.780	-1.295	*1.757*		
	p-value	0.313	0.882	0.555	0.579	0.048	0.447	0.196	0.082	0.045	0.437	0.198	*0.081*		
MSCI Europe	coefficient	**-5.092** ***	**-3.755** **	-3.001	-1.482	**-3.968** **	**-3.234** *	**-4.446** **	**-4.306** **	**-5.079** ***	-0.603	-1.647	***3.391*** **	**1.695** *	0.082
	t-statistic	-2.751	-2.029	-1.587	-0.784	-2.099	-1.710	-2.352	-2.277	-2.687	-0.319	-0.871	*2.537*		
	p-value	0.007	0.045	0.115	0.435	0.038	0.090	0.020	0.024	0.008	0.750	0.385	*0.012*		

Table 16: Test for the Monthly Effect during the First Sub-Period 1997-2000

Results for the regression $R_t = \alpha_1 D_{1t} + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \ldots + \alpha_{12} D_{12t} + e_{t\,t}$ are presented for the period 1997-2000. For each index the estimated coefficient, t-value and p-value are shown.

Country		January	February	March	April	May	June	July	August	September	October	November	December	F-statistic	p-value
Croatia	coefficient	11.200	0.549	2.036	-2.446	-2.933	-0.966	-0.460	-13.187	1.265	-0.653	8.890	6.566	0.749	0.696
	t-statistic	1.594	0.078	0.290	-0.348	-0.417	-0.138	-0.065	-1.876	0.180	-0.093	1.265	0.934		
	p-value	0.120	0.938	0.774	0.730	0.679	0.891	0.948	0.069	0.858	0.926	0.214	0.356		
Czech Republic	coefficient	2.205	2.268	2.819	-1.349	-0.651	-2.965	4.989	-5.673	-3.245	1.674	**-7.922** *	6.790	0.935	0.525
	t-statistic	0.512	0.526	0.654	-0.313	-0.151	-0.688	1.158	-1.317	-0.753	0.389	-1.839	1.576		
	p-value	0.612	0.602	0.517	0.756	0.881	0.496	0.254	0.196	0.456	0.700	0.074	0.124		
Estonia	coefficient	7.080	7.305	10.847	-2.359	**-14.351** *	-4.257	11.737	**14.162** *	**-17.818** **	-4.785	-6.350	3.017	**1.787** *	0.090
	t-statistic	0.955	0.985	1.463	-0.318	-1.935	-0.574	1.583	1.910	-2.403	-0.645	-0.856	0.407		
	p-value	0.346	0.331	0.152	0.752	0.061	0.569	0.122	0.064	0.022	0.523	0.397	0.687		
Hungary	coefficient	7.885	-0.874	-0.468	1.586	-3.023	3.408	6.990	**-11.577** *	-5.012	5.221	-4.315	**15.133** **	1.431	0.198
	t-statistic	1.369	-0.152	-0.081	0.275	-0.525	0.592	1.214	-2.011	-0.870	0.907	-0.749	2.628		
	p-value	0.179	0.880	0.936	0.785	0.603	0.558	0.233	0.052	0.390	0.371	0.458	0.013		
Latvia	coefficient	8.598	2.006	-1.159	3.159	-6.042	-9.247	-2.736	-7.845	-4.394	-1.229	2.782	2.193	0.411	0.943
	t-statistic	0.917	0.262	-0.151	0.413	-0.789	-1.207	-0.357	-1.024	-0.574	-0.161	0.363	0.286		
	p-value	0.369	0.796	0.881	0.684	0.438	0.240	0.724	0.316	0.572	0.874	0.720	0.777		
Lithuania	coefficient	12.790	6.378	5.044	0.242	-4.905	-0.733	-3.104	-4.188	-2.568	-8.143	2.441	6.477	0.756	0.686
	t-statistic	1.687	1.030	0.815	0.039	-0.792	-0.118	-0.501	-0.676	-0.415	-1.315	0.394	1.046		
	p-value	0.105	0.314	0.424	0.969	0.436	0.907	0.621	0.505	0.682	0.201	0.697	0.306		
Poland	coefficient	6.579	5.198	-1.693	0.836	-3.487	1.358	-0.106	-6.053	-2.565	-2.014	-2.397	**8.175** *	0.815	0.634
	t-statistic	1.428	1.128	-0.367	0.181	-0.757	0.295	-0.023	-1.314	-0.557	-0.437	-0.520	1.774		
	p-value	0.162	0.267	0.716	0.857	0.454	0.770	0.982	0.197	0.581	0.665	0.606	0.084		
Romania	coefficient	8.777	1.796	-6.442	-2.919	2.785	5.848	-4.023	**-16.735** *	-3.134	2.042	-4.614	0.893	0.539	0.868
	t-statistic	0.986	0.202	-0.724	-0.328	0.313	0.657	-0.452	-1.881	-0.352	0.230	-0.599	0.116		
	p-value	0.333	0.842	0.476	0.746	0.757	0.517	0.655	0.071	0.728	0.820	0.555	0.909		
Russia	coefficient	-2.491	11.629	6.934	5.007	-12.585	4.273	4.481	**-20.212** *	-17.463	5.706	-6.260	12.831	0.840	0.611
	t-statistic	-0.214	1.001	0.597	0.431	-1.083	0.368	0.386	-1.739	-1.503	0.491	-0.539	1.104		
	p-value	0.831	0.324	0.554	0.669	0.286	0.715	0.702	0.091	0.142	0.626	0.593	0.277		
Slovakia	coefficient	-4.211	-0.719	-1.069	-4.091	-6.384	-3.358	3.152	4.167	-3.121	-2.371	-2.893	2.115	1.073	0.411
	t-statistic	-1.260	-0.215	-0.320	-1.225	-1.911	-1.005	0.943	1.247	-0.934	-0.710	-0.866	0.633		
	p-value	0.216	0.831	0.751	0.229	0.064	0.322	0.352	0.220	0.356	0.482	0.392	0.531		
Slovenia	coefficient	**11.228** ***	-2.666	-2.888	-0.095	-1.660	-2.504	**8.390** ***	0.984	-1.384	-1.828	-2.065	2.887	**2.300** **	0.027
	t-statistic	3.809	-0.904	-0.980	-0.032	-0.563	-0.849	2.846	0.334	-0.469	-0.620	-0.700	0.979		
	p-value	0.001	0.372	0.334	0.974	0.577	0.401	0.007	0.740	0.642	0.539	0.488	0.334		
MSCI Europe	coefficient	-1.114	1.878	3.027	0.715	-0.741	1.890	-0.068	**-3.932** *	-0.929	1.492	-0.138	**5.830** **	1.225	0.306
	t-statistic	-0.506	0.854	1.376	0.325	-0.337	0.859	-0.031	-1.787	-0.422	0.678	-0.063	2.650		
	p-value	0.616	0.399	0.177	0.747	0.738	0.396	0.976	0.082	0.675	0.502	0.950	0.012		
MSCI World	coefficient	-0.087	0.517	2.805	0.816	-1.103	3.333	-0.746	**-4.149** *	-0.913	2.112	-0.078	3.157	0.848	0.603
	t-statistic	-0.038	0.224	1.216	0.354	-0.478	1.445	-0.324	-1.798	-0.396	0.916	-0.034	1.368		
	p-value	0.970	0.824	0.232	0.726	0.635	0.157	0.748	0.080	0.695	0.366	0.973	0.180		
MSCI Emerging Markets	coefficient	-2.170	2.379	2.232	-0.290	-5.286	1.845	-2.282	**-10.830** **	-1.884	-2.114	-1.461	3.681	0.832	0.619
	t-statistic	-0.493	0.541	0.508	-0.066	-1.202	0.419	-0.519	-2.463	-0.428	-0.481	-0.332	0.837		
	p-value	0.625	0.592	0.615	0.948	0.237	0.677	0.607	0.019	0.671	0.634	0.742	0.408		

Notes: ***, **, and * indicate statistical significance for a two-tailed t-test at the one, five and ten percent level respectively.

Table 17: Tests for the Explicit Month-of-the-Year Patterns for the First Sub-Period 1997-2000

January

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for January and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between January and the ith month of the year.

Country		*January*	February	March	April	May	June	July	August	September	October	November	December	F-statistic	p-value
Slovenia	coefficient	***11.228*** ***	**-13.894** ***	**-14.116** ***	**-11.323** *	**-12.888** ***	**-13.732** ***	-2.838	**-10.244** **	**-12.612** ***	**-13.056** ***	**-13.293** ***	**-8.341** *	**2.447** **	0.021
	t-statistic	*3.809*	-3.333	-3.386	-2.716	-3.092	-3.294	-0.681	-2.457	-3.025	-3.132	-3.189	-2.001		
	p-value	*0.001*	0.002	0.002	0.010	0.004	0.002	0.500	0.019	0.005	0.003	0.003	0.053		

May

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for May and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between May and the ith month of the year.

Country		January	February	March	April	*May*	June	July	August	September	October	November	December	F-statistic	p-value
Estonia	coefficient	**21.431** **	**21.656** **	**25.198** **	11.992	*-14.351*	10.094	**26.088** **	**28.513** ***	-3.467	9.566	8.001	17.368	**1.947** *	0.065
	t-statistic	2.044	2.065	2.403	1.144	*-1.935*	0.963	2.488	2.719	-0.331	0.912	0.763	1.656		
	p-value	0.048	0.046	0.022	0.260	*0.061*	0.342	0.018	0.010	0.743	0.368	0.450	0.106		

July

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for July and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between July and the ith month of the year.

Country		January	February	March	April	May	June	*July*	August	September	October	November	December	F-statistic	p-value
Slovenia	coefficient	2.838	**-11.056** **	**-11.278** *	**-8.486** **	**-10.050** **	-10.894	*8.390*	**-7.406** *	**-9.774** **	**-10.218** **	**-10.455** **	-5.504	**2.447** **	0.021
	t-statistic	0.681	-2.652	-2.706	-2.036	-2.411	-2.613	*2.846*	-1.777	-2.345	-2.451	-2.508	-1.320		
	p-value	0.500	0.012	0.010	0.049	0.021	0.013	*0.007*	0.084	0.025	0.019	0.017	0.195		

August

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for August and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between August and the ith month of the year.

Country		January	February	March	April	May	June	July	*August*	September	October	November	December	F-statistic	p-value
Croatia	coefficient	**24.387** **	13.736	15.223	10.741	10.254	12.221	12.728	***-13.187*** *	14.452	12.534	**22.077** **	19.753	0.802	0.638
	t-statistic	2.454	1.382	1.532	1.081	1.032	1.230	1.281	*-1.876*	1.454	1.261	2.221	1.987		
	p-value	0.019	0.175	0.134	0.287	0.309	0.227	0.209	*0.069*	0.155	0.215	0.033	0.055		
Estonia	coefficient	-7.082	-6.857	-3.314	-16.521	**-28.513** *	**-18.419** *	-2.425	***14.162*** *	**-31.979** ***	**-18.946** *	**-20.512** *	-11.145	**1.947** *	0.065
	t-statistic	-0.675	-0.654	-0.316	-1.575	-2.719	-1.756	-0.231	*1.910*	-3.050	-1.807	-1.956	-1.063		
	p-value	0.504	0.517	0.754	0.124	0.010	0.088	0.818	*0.064*	0.004	0.079	0.058	0.295		
Hungary	coefficient	**19.462** **	10.704	11.109	13.163	8.554	**14.985** *	**18.568** **	***-11.577*** *	6.566	**16.798** *	7.263	**26.710** ***	1.510	0.171
	t-statistic	2.390	1.315	1.364	1.617	1.051	1.840	2.280	*-2.011*	0.806	2.063	0.892	3.280		
	p-value	0.022	0.197	0.181	0.115	0.300	0.074	0.029	*0.052*	0.425	0.046	0.378	0.002		
Romania	coefficient	**25.512** *	18.531	10.292	13.816	19.520	**22.583** *	12.712	***-16.735*** *	13.600	18.777	12.120	17.628	0.562	0.842
	t-statistic	2.027	1.472	0.818	1.098	1.551	1.794	1.010	*-1.881*	1.081	1.492	1.030	1.497		
	p-value	0.053	0.153	0.421	0.282	0.133	0.084	0.322	*0.071*	0.290	0.148	0.313	0.146		
Russia	coefficient	17.721	**31.841** *	27.146	25.219	7.627	24.485	24.693	***-20.212*** *	2.749	25.918	13.952	**33.043** *	0.913	0.539
	t-statistic	1.078	1.938	1.652	1.535	0.464	1.490	1.503	*-1.739*	0.167	1.577	0.849	2.011		
	p-value	0.288	0.061	0.107	0.134	0.645	0.145	0.142	*0.091*	0.868	0.124	0.401	0.052		
MSCI Europe	coefficient	2.819	**5.810** *	**6.959** **	4.647	3.192	**5.822** *	3.865	***-3.932*** *	3.003	**5.424** **	3.794	**9.762** ***	1.238	0.299
	t-statistic	0.906	1.868	2.237	1.494	1.026	1.871	1.242	*-1.787*	0.965	1.743	1.219	3.138		
	p-value	0.371	0.070	0.032	0.144	0.312	0.069	0.222	*0.082*	0.341	0.090	0.231	0.003		
MSCI World	coefficient	4.062	4.666	**6.953** **	4.965	3.046	**7.482** **	3.402	***-4.149*** *	3.236	**6.261** **	4.071	**7.306** **	0.880	0.567
	t-statistic	1.245	1.430	2.131	1.522	0.934	2.293	1.043	*-1.798*	0.992	1.919	1.248	2.239		
	p-value	0.221	0.161	0.040	0.137	0.357	0.028	0.304	*0.080*	0.328	0.063	0.220	0.031		

September

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for September and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between September and the ith month of the year.

Country		January	February	March	April	May	June	July	August	*September*	October	November	December	F-statistic	p-value
Estonia	coefficient	**24.897** **	**25.123** **	**28.665** *	15.459	3.467	13.561	**29.555** ***	**31.979** ***	***-17.818*** **	13.033	11.467	**20.834** *	**1.947** *	0.065
	t-statistic	2.374	2.396	2.734	1.474	0.331	1.293	2.818	3.050	*-2.403*	1.243	1.094	1.987		
	p-value	0.023	0.022	0.010	0.149	0.743	0.204	0.008	0.004	*0.022*	0.222	0.281	0.055		

November

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for November and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between November and the ith month of the year.

Country		January	February	March	April	May	June	July	August	September	October	*November*	December	F-statistic	p-value
Czech	coefficient	10.127	10.189	**10.740** *	6.573	7.271	4.956	**12.911** **	2.249	4.677	9.596	***-7.922*** *	**14.712** **	1.020	0.450
	t-statistic	1.662	1.672	1.763	1.079	1.193	0.813	2.119	0.369	0.768	1.575	*-1.839*	2.415		
	p-value	0.105	0.103	0.086	0.288	0.241	0.421	0.041	0.714	0.448	0.124	*0.074*	0.021		

December

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for December and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between December and the ith month of the year.

Country		January	February	March	April	May	June	July	August	September	October	November	*December*	F-statistic	p-value
Hungary	coefficient	-7.248	**-16.007** **	**-15.601** *	-13.547	**-18.156** **	-11.725	-8.143	**-26.710** ***	**-20.145** **	-9.912	**-19.448** **	***15.133*** **	1.510	0.171
	t-statistic	-0.890	-1.966	-1.916	-1.664	-2.230	-1.440	-1.000	-3.280	-2.474	-1.217	-2.388	*2.628*		
	p-value	0.379	0.057	0.063	0.105	0.032	0.159	0.324	0.002	0.018	0.231	0.022	*0.013*		
Poland	coefficient	-1.596	-2.978	-9.868	-7.340	**-11.663** *	-6.817	-8.282	**-14.229** **	-10.740	-10.190	-10.572	***8.175*** *	0.884	0.563
	t-statistic	-0.245	-0.457	-1.514	-1.126	-1.790	-1.046	-1.271	-2.183	-1.648	-1.564	-1.622	*1.774*		
	p-value	0.808	0.650	0.139	0.267	0.082	0.302	0.212	0.036	0.108	0.127	0.113	*0.084*		
MSCI Europe	coefficient	-5.851	-1.302	-1.449	-3.971	-8.967	-1.836	-5.963	**-14.511** **	-5.565	-5.795	-5.142	*3.681*	0.805	0.635
	t-statistic	-0.941	-0.209	-0.233	-0.639	-1.442	-0.295	-0.959	-2.333	-0.895	-0.932	-0.827	*0.837*		
	p-value	0.353	0.835	0.817	0.527	0.158	0.769	0.344	0.025	0.377	0.358	0.414	*0.408*		

Table 18: Test for the Monthly Effect during the Second Sub-Period 2001-2004

Results for the regression $R_t = \alpha_1 D_{1t} + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \ldots + \alpha_{12} D_{12t} + e_{1t}$ are presented for the period 2001-2004. For each index the estimated coefficient, t-value and p-value are shown.

Country		January	February	March	April	May	June	July	August	September	October	November	December	F-statistic	p-value
Bulgaria	coefficient	3.686	3.445	-4.698	4.550	-1.823	**11.756** ***	**7.307** *	2.104	5.153	4.315	5.089	4.628	**1.880** *	0.072
	t-statistic	0.923	0.863	-1.176	1.139	-0.456	2.943	1.829	0.527	1.290	1.080	1.274	1.158		
	p-value	0.362	0.394	0.247	0.262	0.651	0.006	0.076	0.602	0.205	0.287	0.211	0.254		
Croatia	coefficient	1.504	1.251	0.247	2.314	-1.412	0.520	-1.233	2.625	-1.168	3.015	**6.795** ***	-0.008	1.165	0.345
	t-statistic	0.643	0.534	0.105	0.989	-0.603	0.222	-0.527	1.122	-0.499	1.289	2.904	-0.003		
	p-value	0.524	0.596	0.917	0.329	0.550	0.825	0.601	0.269	0.621	0.206	0.006	0.997		
Czech Republic	coefficient	4.512	-0.180	1.633	1.259	2.168	**-4.951** *	1.548	2.026	-1.385	4.323	4.150	1.237	1.084	0.402
	t-statistic	1.630	-0.065	0.590	0.455	0.783	-1.788	0.559	0.732	-0.500	1.562	1.499	0.447		
	p-value	0.112	0.948	0.559	0.652	0.439	0.082	0.579	0.469	0.620	0.127	0.143	0.658		
Estonia	coefficient	**6.079** **	2.065	1.003	2.738	**4.927** *	-2.338	-1.119	1.781	-1.406	3.389	**4.933** **	**7.311** **	**1.959** *	0.060
	t-statistic	2.227	0.757	0.368	1.003	1.805	-0.857	-0.410	0.652	-0.515	1.242	1.807	2.679		
	p-value	0.032	0.454	0.715	0.322	0.079	0.397	0.684	0.518	0.610	0.222	0.079	0.011		
Hungary	coefficient	**4.873** *	**-4.528** *	1.572	5.205	0.150	**-5.471** **	-0.569	**4.749** *	-2.105	**5.803** **	3.685	0.037	**2.279** **	0.029
	t-statistic	1.908	-1.773	0.616	2.038	0.059	-2.142	-0.223	1.860	-0.824	2.272	1.443	0.014		
	p-value	0.064	0.085	0.542	0.049	0.953	0.039	0.825	0.071	0.415	0.029	0.158	0.989		
Latvia	coefficient	0.879	0.346	1.347	1.312	0.218	-0.411	**7.762** **	1.389	-3.459	2.644	1.591	0.839	0.562	0.857
	t-statistic	0.242	0.095	0.371	0.361	0.060	-0.113	2.137	0.383	-0.952	0.728	0.438	0.231		
	p-value	0.810	0.925	0.713	0.720	0.952	0.911	0.039	0.704	0.347	0.471	0.664	0.819		
Lithuania	coefficient	5.843	4.092	-1.309	3.050	-2.545	2.810	**6.093** *	-1.828	-0.339	-1.178	-0.048	-1.690	0.788	0.659
	t-statistic	1.633	1.143	-0.366	0.852	-0.711	0.785	1.702	-0.511	-0.095	-0.329	-0.013	-0.472		
	p-value	0.111	0.260	0.717	0.400	0.482	0.437	0.097	0.613	0.925	0.744	0.989	0.640		
Poland	coefficient	3.623	-3.773	-0.976	2.662	2.472	-3.877	-0.560	4.866	-5.413	**8.128** **	-0.367	0.962	1.376	0.223
	t-statistic	1.107	-1.153	-0.298	0.813	0.755	-1.184	-0.171	1.486	-1.653	2.483	-0.112	0.294		
	p-value	0.276	0.257	0.767	0.422	0.455	0.244	0.865	0.146	0.107	0.018	0.911	0.770		
Romania	coefficient	**7.054** *	1.597	2.658	5.343	3.810	4.567	2.946	6.098	1.497	4.822	1.758	5.136	1.230	0.302
	t-statistic	1.810	0.410	0.682	1.371	0.978	1.172	0.756	1.565	0.384	1.237	0.451	1.318		
	p-value	0.079	0.684	0.499	0.179	0.335	0.249	0.455	0.126	0.703	0.224	0.655	0.196		
Russia	coefficient	**8.201** *	4.322	4.811	4.276	4.145	1.414	**-9.249** **	7.130	-0.266	2.287	0.982	5.064	1.314	0.255
	t-statistic	1.835	0.967	1.077	0.957	0.927	0.316	-2.070	1.596	-0.060	0.512	0.220	1.133		
	p-value	0.075	0.340	0.289	0.345	0.360	0.754	0.046	0.119	0.953	0.612	0.827	0.265		
Slovakia	coefficient	-0.377	0.751	-1.322	-0.381	3.555	3.026	0.739	4.638	4.568	3.738	**10.114** ***	4.996	**1.802** *	0.087
	t-statistic	-0.121	0.242	-0.426	-0.123	1.145	0.974	0.238	1.493	1.471	1.204	3.257	1.609		
	p-value	0.904	0.810	0.673	0.903	0.260	0.336	0.813	0.144	0.150	0.237	0.002	0.116		
Slovenia	coefficient	2.154	-2.336	2.872	2.397	0.929	-0.686	1.721	**5.980** ***	2.956	2.002	3.053	0.240	**1.944** *	0.063
	t-statistic	1.120	-1.215	1.493	1.247	0.483	-0.357	0.895	3.109	1.537	1.041	1.588	0.125		
	p-value	0.270	0.232	0.144	0.221	0.632	0.723	0.377	0.004	0.133	0.305	0.121	0.902		
MSCI Europe	coefficient	-2.337	-3.210	-2.999	3.284	-0.304	-1.439	-3.247	0.226	**-5.033** **	**5.101** **	**4.426** *	2.265	1.715	0.106
	t-statistic	-0.951	-1.306	-1.220	1.336	-0.124	-0.586	-1.321	0.092	-2.048	2.075	1.800	0.921		
	p-value	0.348	0.200	0.230	0.190	0.902	0.562	0.195	0.927	0.048	0.045	0.080	0.363		
MSCI World	coefficient	-0.732	-2.859	-1.800	2.095	0.406	-1.438	-2.842	0.025	**-4.701** **	2.878	**3.457** *	1.024	1.409	0.208
	t-statistic	-0.360	-1.405	-0.884	1.029	0.199	-0.707	-1.396	0.012	-2.310	1.414	1.698	0.503		
	p-value	0.721	0.169	0.383	0.310	0.843	0.484	0.171	0.990	0.027	0.166	0.098	0.618		
MSCI Emerging Markets	coefficient	4.486	-1.366	-2.741	1.182	0.795	-1.508	-3.465	2.664	**-5.994** **	4.608	**6.162** **	2.938	1.567	0.147
	t-statistic	1.554	-0.473	-0.949	0.409	0.275	-0.522	-1.200	0.923	-2.076	1.596	2.134	1.018		
	p-value	0.129	0.639	0.349	0.685	0.785	0.605	0.238	0.362	0.045	0.119	0.040	0.316		

Notes: ***, **, and * indicate statistical significance for a two-tailed t-test at the one, five and ten percent level respectively.

Table 19: Tests for the Explicit Month-of-the-Year Patterns for the Second Sub-Period 2001-2004

January

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for January and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between January and the ith month of the year.

Country		*January*	February	March	April	May	June	July	August	September	October	November	December	F-statistic	p-value
Estonia	coefficient	***6.079*** **	-4.015	-5.076	-3.341	-1.152	**-8.417** **	**-7.198** *	-4.299	**-7.485** *	-2.691	-1.146	1.232	1.260	0.286
	t-statistic	*2.227*	-1.040	-1.315	-0.866	-0.298	-2.181	-1.865	-1.114	-1.939	-0.697	-0.297	0.319		
	p-value	*0.032*	0.305	0.197	0.392	0.767	0.036	0.070	0.273	0.060	0.490	0.768	0.751		
Hungary	coefficient	***4.873*** *	**-9.401** **	-3.301	0.332	-4.723	**-10.344** ***	-5.442	-0.124	**-6.978** *	0.930	-1.188	-4.837	**2.277** **	0.031
	t-statistic	*1.908*	-2.603	-0.914	0.092	-1.308	-2.864	-1.507	-0.034	-1.932	0.258	-0.329	-1.339		
	p-value	*0.064*	0.013	0.367	0.927	0.199	0.007	0.141	0.973	0.061	0.798	0.744	0.189		

February

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for February and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between February and the ith month of the year.

Country		January	*February*	March	April	May	June	July	August	September	October	November	December	F-statistic	p-value
Hungary	coefficient	**9.401** **	***-4.528*** *	**6.100** *	**9.733** **	4.678	-0.943	3.959	**9.277** **	2.423	**10.331** ***	**8.213** **	4.564	**2.277** **	0.031
	t-statistic	2.603	*-1.773*	1.689	2.695	1.295	-0.261	1.096	2.569	0.671	2.861	2.274	1.264		
	p-value	0.013	*0.085*	0.100	0.011	0.203	0.796	0.280	0.015	0.507	0.007	0.029	0.214		

May

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for May and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between May and the ith month of the year.

Country		January	February	March	April	*May*	June	July	August	September	October	November	December	F-statistic	p-value
Estonia	coefficient	1.152	-2.862	-3.924	-2.189	***4.927*** *	**-7.265** *	-6.046	-3.147	-6.333	-1.539	0.006	2.384	1.260	0.286
	t-statistic	0.298	-0.742	-1.017	-0.567	*1.805*	-1.882	-1.566	-0.815	-1.641	-0.399	0.002	0.618		
	p-value	0.767	0.463	0.316	0.574	*0.079*	0.068	0.126	0.420	0.110	0.693	0.999	0.541		

June

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for June and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between June and the ith month of the year.

Country		January	February	March	April	May	*June*	July	August	September	October	November	December	F-statistic	p-value
Bulgaria	coefficient	-8.070	-8.311	**-16.454** ***	-7.206	**-13.579** **	***11.756*** ***	-4.449	**-9.652** *	-6.603	-7.441	-6.667	-7.128	1.068	0.413
	t-statistic	-1.428	-1.471	-2.913	-1.275	-2.404	*2.943*	-0.787	-1.709	-1.169	-1.317	-1.180	-1.262		
	p-value	0.162	0.150	0.006	0.210	0.022	*0.006*	0.436	0.096	0.250	0.196	0.246	0.215		
Czech Republic	coefficient	**9.463** **	4.770	6.583	6.209	**7.119** *	***-4.951*** *	6.499	**6.976** *	3.566	**9.273** **	**9.101** **	6.187	0.919	0.533
	t-statistic	2.417	1.219	1.682	1.586	1.818	*-1.788*	1.660	1.782	0.911	2.369	2.325	1.580		
	p-value	0.021	0.231	0.101	0.121	0.077	*0.082*	0.106	0.083	0.368	0.023	0.026	0.123		
Hungary	coefficient	**10.344** ***	0.943	**7.043** *	**10.675** ***	5.621	***-5.471*** **	4.902	**10.220** ***	3.366	**11.274** ***	**9.156** **	5.507	**2.277** **	0.031
	t-statistic	2.864	0.261	1.950	2.956	1.556	*-2.142*	1.357	2.830	0.932	3.122	2.535	1.525		
	p-value	0.007	0.796	0.059	0.005	0.128	*0.039*	0.183	0.008	0.358	0.004	0.016	0.136		

July

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for July and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between July and the ith month of the year.

Country		January	February	March	April	May	June	*July*	August	September	October	November	December	F-statistic	p-value
Bulgaria	coefficient	-3.621	-3.862	**-12.005** **	-2.757	-9.130	4.449	***7.307*** *	-5.204	-2.155	-2.993	-2.218	-2.680	1.068	0.413
	t-statistic	-0.641	-0.684	-2.125	-0.488	-1.616	0.787	*1.829*	-0.921	-0.381	-0.530	-0.393	-0.474		
	p-value	0.526	0.499	0.041	0.628	0.115	0.436	*0.076*	0.363	0.705	0.600	0.697	0.638		
Latvia	coefficient	-6.882	-7.415	-6.414	-6.449	-7.543	-8.172	*7.762*	-6.372	**-11.220** **	-5.117	-6.170	-6.923	0.494	0.895
	t-statistic	-1.340	-1.444	-1.249	-1.256	-1.469	-1.591	*1.096*	-1.241	-2.185	-0.996	-1.201	-1.348		
	p-value	0.189	0.157	0.220	0.217	0.151	0.120	*0.280*	0.223	0.035	0.326	0.237	0.186		
Lithuania	coefficient	-0.250	-2.002	-7.402	-3.043	**-8.638** *	-3.283	***6.093*** *	-7.921	-6.432	-7.271	-6.141	-7.783	0.760	0.675
	t-statistic	-0.049	-0.395	-1.462	-0.601	-1.707	-0.649	*1.702*	-1.565	-1.271	-1.437	-1.213	-1.538		
	p-value	0.961	0.695	0.152	0.552	0.097	0.521	*0.097*	0.126	0.212	0.159	0.233	0.133		
Russia	coefficient	**17.450** ***	**13.571** **	**14.060** **	**13.524** **	**13.394** **	**10.663** *	***-9.249*** *	**16.379** **	8.983	**11.535** *	10.231	**14.313** **	1.017	0.452
	t-statistic	2.761	2.147	2.225	2.140	2.119	1.687	*-2.070*	2.592	1.421	1.825	1.619	2.265		
	p-value	0.009	0.039	0.032	0.039	0.041	0.100	*0.046*	0.014	0.164	0.076	0.114	0.030		

August

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for August and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between August and the ith month of the year.

Country		January	February	March	April	May	June	July	*August*	September	October	November	December	F-statistic	p-value
Hungary	coefficient	0.124	**-9.277** **	-3.177	0.456	-4.599	**-10.220** ***	-5.318	***4.749*** *	**-6.853** *	1.054	-1.064	-4.712	**2.277** **	0.031
	t-statistic	0.034	-2.569	-0.880	0.126	-1.273	-2.830	-1.472	*1.860*	-1.898	0.292	-0.295	-1.305		
	p-value	0.973	0.015	0.385	0.900	0.211	0.008	0.150	*0.071*	0.066	0.772	0.770	0.200		
Slovenia	coefficient	-3.825	**-8.316** ***	-3.108	-3.582	**-5.050** *	**-6.666** **	-4.259	***5.980*** **	-3.023	-3.978	-2.927	**-5.740** **	1.193	0.326
	t-statistic	-1.407	-3.057	-1.143	-1.317	-1.857	-2.451	-1.566	*3.109*	-1.112	-1.462	-1.076	-2.110		
	p-value	0.168	0.004	0.261	0.196	0.072	0.019	0.126	*0.004*	0.274	0.152	0.289	0.042		

September

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for September and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between September and the ith month of the year.

Country		January	February	March	April	May	June	July	August	*September*	October	November	December	F-statistic	p-value
MSCI Europe	coefficient	2.696	1.824	2.035	**8.317** **	4.729	3.594	1.786	5.259	***-5.033*** **	**10.135** ***	**9.459** *	**7.298** **	**1.858** *	0.080
	t-statistic	0.776	0.525	0.585	2.392	1.360	1.034	0.514	1.513	*-2.048*	2.915	2.721	2.099		
	p-value	0.443	0.603	0.562	0.022	0.182	0.308	0.610	0.139	*0.048*	0.006	0.010	0.043		
MSCI World	coefficient	3.969	1.842	2.901	**6.796** **	**5.107** *	3.263	1.859	4.726	***-4.701*** **	**7.579** **	**8.158** ***	**5.725** *	1.500	0.174
	t-statistic	1.379	0.640	1.008	2.361	1.774	1.133	0.646	1.642	*-2.310*	2.633	2.834	1.989		
	p-value	0.176	0.526	0.320	0.024	0.085	0.265	0.523	0.109	*0.027*	0.012	0.007	0.054		
MSCI Emerging Markets	coefficient	**10.480** **	4.628	3.253	**7.176** *	6.789	4.486	2.529	**8.658** **	***-5.994*** **	**10.602**	**12.156** ***	**8.932** **	1.654	0.125
	t-statistic	2.567	1.134	0.797	1.758	1.663	1.099	0.619	2.121	*-2.076*	2.597	2.977	2.188		
	p-value	0.015	0.264	0.431	0.087	0.105	0.279	0.540	0.041	*0.045*	0.014 **	0.005	0.035		

October

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for October and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between October and the ith month of the year.

Country		January	February	March	April	May	June	July	August	September	*October*	November	December	F-statistic	p-value
Hungary	coefficient	-0.930	**-10.331** ***	-4.231	-0.599	-5.653	**-11.274** ***	**-6.372** *	-1.054	**-7.908** **	***5.803*** **	-2.118	-5.767	**2.277** **	0.031
	t-statistic	-0.258	-2.861	-1.172	-0.166	-1.565	-3.122	-1.764	-0.292	-2.190	*2.272*	-0.586	-1.597		
	p-value	0.798	0.007	0.249	0.869	0.126	0.004	0.086	0.772	0.035	*0.029*	0.561	0.119		
Poland	coefficient	-4.504	**-11.901** **	**-9.104** *	-5.466	-5.656	**-12.004** **	**-8.688** *	-3.262	**-13.541** ***	***8.128*** **	**-8.495** *	-7.166	1.459	0.190
	t-statistic	-0.973	-2.571	-1.966	-1.181	-1.222	-2.593	-1.876	-0.705	-2.925	*2.483*	-1.835	-1.548		
	p-value	0.337	0.014	0.057	0.246	0.230	0.014	0.069	0.486	0.006	*0.018*	0.075	0.130		
MSCI Europe	coefficient	**-7.438** **	**-8.311** **	**-8.100** **	-1.818	-5.405	**-6.541** *	**-8.348** **	-4.875	**-10.135** ***	***5.101*** **	-0.676	-2.837	**1.858** *	0.080
	t-statistic	-2.140	-2.391	-2.330	-0.523	-1.555	-1.881	-2.401	-1.402	-2.915	*2.075*	-0.194	-0.816		
	p-value	0.039	0.022	0.026	0.604	0.129	0.068	0.022	0.169	0.006	*0.045*	0.847	0.420		

November

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for November and the coefficient α_i, $i = 2,..., 12$, indicates the difference in return between November and the ith month of the year.

Country		January	February	March	April	May	June	July	August	September	October	*November*	December	F-statistic	p-value
Estonia	coefficient	1.146	-2.868	-3.930	-2.195	-0.006	**-7.271** *	-6.052	-3.153	-6.339	-1.545	***4.933*** *	2.378	1.260	0.286
	t-statistic	0.297	-0.743	-1.018	-0.569	-0.002	-1.884	-1.568	-0.817	-1.642	-0.400	*1.807*	0.616		
	p-value	0.768	0.462	0.315	0.573	0.999	0.068	0.126	0.419	0.109	0.691	*0.079*	0.542		
Slovakia	coefficient	**-10.491** **	**-9.363** **	**-11.436** **	**-10.495** *	-6.559	-7.088	**-9.375** **	-5.476	-5.546	-6.375	***10.114*** ***	-5.118	1.055	0.422
	t-statistic	-2.389	-2.132	-2.604	-2.390	-1.493	-1.614	-2.135	-1.247	-1.263	-1.452	*3.257*	-1.165		
	p-value	0.022	0.040	0.013	0.022	0.144	0.115	0.040	0.221	0.215	0.155	*0.002*	0.252		
MSCI Europe	coefficient	**-6.763** *	**-7.635** **	**-7.424** **	-1.142	-4.730	**-5.865** *	**-7.673** **	-4.200	**-9.459** *	0.676	***4.426*** *	-2.161	**1.858** *	0.080
	t-statistic	-1.945	-2.196	-2.136	-0.328	-1.361	-1.687	-2.207	-1.208	-2.721	0.194	*1.800*	-0.622		
	p-value	0.060	0.035	0.040	0.744	0.182	0.100	0.034	0.235	0.010	0.847	*0.080*	0.538		
MSCI World	coefficient	-4.189	**-6.316** **	**-5.257** *	-1.362	-3.051	**-4.895** *	**-6.299** **	-3.432	-8.158	-0.579	***3.457*** *	-2.434	1.500	0.174
	t-statistic	-1.455	-2.194	-1.826	-0.473	-1.060	-1.701	-2.188	-1.192	-2.834	-0.201	*1.698*	-0.845		
	p-value	0.154	0.035	0.076	0.639	0.296	0.098	0.035	0.241	0.007	0.842	*0.098*	0.403		
MSCI Emerging Markets	coefficient	-1.676	**-7.528** *	**-8.903** **	-4.980	-5.368	**-7.671** *	**-9.628** **	-3.498	**-12.156** ***	-1.554	***6.162*** **	-3.224	1.654	0.125
	t-statistic	-0.411	-1.844	-2.181	-1.220	-1.315	-1.879	-2.358	-0.857	-2.977	-0.381	*2.134*	-0.790		
	p-value	0.684	0.073	0.036	0.230	0.197	0.068	0.024	0.397	0.005	0.706	*0.040*	0.435		

December

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for December and the coefficient α_i, $i = 2,..., 12$, indicates the difference in return between December and the ith month of the year.

Country		January	February	March	April	May	June	July	August	September	October	November	*December*	F-statistic	p-value
Estonia	coefficient	-1.232	-5.246	-6.308	-4.573	-2.384	**-9.649** **	**-8.430** **	-5.530	**-8.717** **	-3.923	-2.378	***7.311*** **	1.260	0.286
	t-statistic	-0.319	-1.359	-1.634	-1.185	-0.618	-2.500	-2.184	-1.433	-2.258	-1.016	-0.616	*2.679*		
	p-value	0.751	0.183	0.111	0.244	0.541	0.017	0.036	0.161	0.030	0.316	0.542	*0.011*		

Table 20: Test for the Monthly Effect during the Third Sub-Period 2005-2008

Results for the regression $R_t = \alpha_1 D_{1t} + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + \ldots + \alpha_{12} D_{12t} + e_{1t}$ are presented for the period 2005-2008. For each index the estimated coefficient, t-value and p-value are shown.

Country		January	February	March	April	May	June	July	August	September	October	November	December	F-statistic	p-value
Bulgaria	coefficient	1.095	**7.445** *	-2.253	-1.729	1.078	0.399	6.879	3.479	7.907	3.173	-1.872	1.643	0.751	0.691
	t-statistic	0.254	1.728	-0.453	-0.348	0.217	0.080	1.383	0.699	1.589	0.638	-0.376	0.330		
	p-value	0.801	0.096	0.654	0.731	0.830	0.937	0.179	0.491	0.124	0.529	0.710	0.744		
Croatia	coefficient	6.254	-0.164	2.020	3.440	1.589	2.472	5.028	2.424	5.133	1.193	-3.218	2.797	0.589	0.830
	t-statistic	1.548	-0.041	0.433	0.738	0.341	0.530	1.078	0.520	1.101	0.256	-0.690	0.600		
	p-value	0.134	0.968	0.668	0.467	0.736	0.601	0.291	0.608	0.281	0.800	0.496	0.554		
Czech Republic	coefficient	-1.974	2.101	0.405	0.066	-3.105	2.647	1.203	3.410	2.249	1.592	-2.113	2.509	0.417	0.942
	t-statistic	-0.662	0.705	0.118	0.019	-0.902	0.769	0.349	0.990	0.653	0.463	-0.614	0.729		
	p-value	0.514	0.487	0.907	0.985	0.375	0.449	0.730	0.331	0.519	0.648	0.545	0.473		
Estonia	coefficient	-0.668	1.471	6.755	0.365	-6.748	1.383	0.929	-0.848	2.618	-5.091	-1.245	3.137	0.598	0.823
	t-statistic	-0.173	0.381	1.516	0.082	-1.514	0.310	0.208	-0.190	0.588	-1.142	-0.279	0.704		
	p-value	0.864	0.706	0.142	0.935	0.142	0.759	0.837	0.851	0.562	0.264	0.782	0.488		
Hungary	coefficient	-0.863	4.175	-3.058	2.432	-2.094	4.954	4.842	-1.411	2.336	-4.596	-0.280	3.213	0.701	0.736
	t-statistic	-0.253	1.222	-0.775	0.617	-0.531	1.256	1.227	-0.358	0.592	-1.165	-0.071	0.815		
	p-value	0.802	0.233	0.445	0.543	0.600	0.220	0.231	0.723	0.559	0.255	0.944	0.423		
Latvia	coefficient	0.223	-1.934	1.772	1.569	**-9.097** *	8.424	4.528	6.090	5.415	-1.280	1.744	2.123	0.870	0.586
	t-statistic	0.052	-0.447	0.355	0.314	-1.821	1.686	0.906	1.219	1.084	-0.256	0.349	0.425		
	p-value	0.959	0.659	0.726	0.756	0.080	0.104	0.373	0.234	0.288	0.800	0.730	0.674		
Lithuania	coefficient	-1.431	0.547	2.739	2.248	-2.604	3.844	2.771	2.354	4.254	-1.569	-2.722	4.313	0.347	0.971
	t-statistic	-0.342	0.131	0.567	0.465	-0.539	0.796	0.574	0.488	0.881	-0.325	-0.564	0.893		
	p-value	0.735	0.897	0.575	0.645	0.594	0.433	0.571	0.630	0.386	0.748	0.578	0.380		
Poland	coefficient	-1.308	-0.097	3.394	2.429	-0.365	3.535	5.005	-1.467	2.024	1.557	0.295	0.845	0.342	0.972
	t-statistic	-0.374	-0.028	0.841	0.602	-0.090	0.876	1.240	-0.363	0.501	0.386	0.073	0.209		
	p-value	0.711	0.978	0.408	0.552	0.929	0.389	0.226	0.719	0.620	0.703	0.942	0.836		
Romania	coefficient	5.486	1.446	-10.286	-2.655	-3.266	3.980	8.009	1.214	2.861	2.086	-2.419	2.271	0.727	0.713
	t-statistic	1.136	0.299	-1.844	-0.476	-0.586	0.714	1.436	0.218	0.513	0.374	-0.434	0.407		
	p-value	0.266	0.767	0.077	0.638	0.563	0.482	0.163	0.829	0.612	0.711	0.668	0.687		
Russia	coefficient	-0.801	5.544	-0.060	4.073	-6.780	3.907	4.974	5.259	4.923	0.425	5.776	5.915	1.128	0.382
	t-statistic	-0.209	1.447	-0.014	0.921	-1.533	0.883	1.125	1.189	1.113	0.096	1.306	1.337		
	p-value	0.836	0.160	0.989	0.366	0.137	0.385	0.271	0.245	0.276	0.924	0.203	0.193		
Slovakia	coefficient	0.421	**5.902** *	1.145	-1.645	-4.284	0.348	4.813	2.585	-0.873	0.767	-3.076	0.434	0.799	0.648
	t-statistic	0.143	2.012	0.338	-0.485	-1.265	0.103	1.421	0.763	-0.258	0.226	-0.908	0.128		
	p-value	0.887	0.055	0.738	0.631	0.217	0.919	0.167	0.452	0.799	0.823	0.372	0.899		
Slovenia	coefficient	1.731	-1.556	0.957	**6.220** *	2.378	2.294	4.671	2.881	0.266	1.154	-0.159	2.116	0.791	0.655
	t-statistic	0.636	-0.572	0.305	1.979	0.757	0.730	1.486	0.917	0.085	0.367	-0.051	0.673		
	p-value	0.530	0.573	0.763	0.058	0.456	0.472	0.149	0.368	0.933	0.716	0.960	0.507		
MSCI Europe	coefficient	-1.652	0.239	1.392	1.669	-0.724	-0.024	0.552	1.589	1.759	1.433	0.676	1.640	0.354	0.968
	t-statistic	-0.877	0.127	0.640	0.767	-0.333	-0.011	0.254	0.730	0.809	0.659	0.311	0.754		
	p-value	0.388	0.900	0.528	0.450	0.742	0.991	0.802	0.472	0.426	0.516	0.758	0.458		
MSCI World	coefficient	-1.091	-0.417	0.375	1.303	-0.015	-0.776	0.063	1.191	2.173	1.051	0.975	0.731	0.372	0.962
	t-statistic	-0.738	-0.282	0.220	0.764	-0.009	-0.455	0.037	0.698	1.274	0.616	0.572	0.428		
	p-value	0.467	0.780	0.828	0.452	0.993	0.653	0.971	0.491	0.214	0.543	0.573	0.672		
MSCI Emerging Markets	coefficient	-1.208	2.498	-0.586	1.657	-1.457	1.898	3.059	1.337	5.488	2.172	2.045	3.180	0.527	0.877
	t-statistic	-0.394	0.814	-0.165	0.468	-0.411	0.536	0.864	0.377	1.549	0.613	0.577	0.898		
	p-value	0.697	0.423	0.870	0.644	0.684	0.597	0.396	0.709	0.133	0.545	0.569	0.378		

Notes: ***, **, and * indicate statistical significance for a two-tailed t-test at the one, five and ten percent level respectively.

Table 21: Tests for the Explicit Month-of-the-Year Patterns for the Third Sub-Period 2005-2008

February

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for February and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between February and the ith month of the year.

Country		January	*February*	March	April	May	June	July	August	September	October	November	December	F-statistic	p-value
Bulgaria	coefficient	-6.349	***7.445*** *	-9.697	-9.174	-6.367	-7.046	-0.565	-3.966	0.462	-4.272	-9.317	-5.801	0.557	0.845
	t-statistic	-1.042	*1.728*	-1.473	-1.394	-0.967	-1.071	-0.086	-0.603	0.070	-0.649	-1.416	-0.881		
	p-value	0.307	*0.096*	0.153	0.175	0.342	0.294	0.932	0.552	0.945	0.522	0.169	0.386		
Slovakia	coefficient	-5.481	***5.902*** *	-4.757	-7.547	**-10.186** **	-5.554	-1.089	-3.317	-6.775	-5.136	**-8.978** *	-5.469	0.825	0.617
	t-statistic	-1.321	*2.012*	-1.062	-1.684	-2.273	-1.239	-0.243	-0.740	-1.512	-1.146	-2.004	-1.220		
	p-value	0.198	*0.055*	0.298	0.104	0.032	0.226	0.810	0.466	0.143	0.262	0.056	0.233		

April

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for April and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between April and the ith month of the year.

Country		January	February	March	*April*	May	June	July	August	September	October	November	December	F-statistic	p-value
Slovenia	coefficient	-4.489	**-7.776** *	-5.263	***6.220*** *	-3.842	-3.926	-1.549	-3.339	-5.954	-5.066	-6.379	-4.104	0.478	0.900
	t-statistic	-1.080	-1.870	-1.184	*1.979*	-0.864	-0.883	-0.349	-0.751	-1.340	-1.140	-1.435	-0.923		
	p-value	0.290	0.073	0.247	*0.058*	0.395	0.385	0.730	0.459	0.192	0.265	0.163	0.364		

May

Results for the regression $R_t = c + \alpha_2 D_{2t} + \alpha_3 D_{3t} + \alpha_4 D_{4t} + ... + \alpha_{12} D_{12t} + e_t$ where the intercept, c, indicates the average return for May and the coefficient α_i, $i = 2,\ldots, 12$, indicates the difference in return between May and the ith month of the year.

Country		January	February	March	April	*May*	June	July	August	September	October	November	December	F-statistic	p-value
Latvia	coefficient	9.320	7.163	10.870	10.666	***-9.097*** *	**17.521** **	**13.625** *	**15.187** **	**14.512** *	7.817	10.841	11.220	0.845	0.600
	t-statistic	1.410	1.084	1.538	1.510	*-1.821*	2.480	1.928	2.149	2.054	1.106	1.534	1.588		
	p-value	0.751	0.183	0.111	0.244	*0.080*	0.020	0.065	0.041	0.050	0.279	0.137	0.124		

Annex 3: Tests for the Turn-of-the-Month Effect

Table 22: Test for the 16-day Period around the Turn-of-the-Month during the Whole Sample Period 1997-2008

Results for the regression $R_t = \beta_{-8}D_{-8,t} + \beta_{-7}D_{-7,t} + \ldots + \beta_7 D_{7t} + \beta_8 D_{8,t} + e_t$ are presented for the period 1997-2008. For each index the estimated coefficient, t-value and p-value are shown.

Country		-8	-7	-6	-5	-4	-3	-2	-1	1	2	3	4	5	6	7	8	F-statistic	p-value
Bulgaria	coefficient	-0.046	0.295	0.212	0.315	0.188	0.403	0.262	**0.667** ***	-0.165	0.141	-0.221	0.084	0.111	0.199	0.313	-0.165	**2.040** ***	0.009
	t-statistic	-0.238	1.523	1.093	1.628	0.971	2.084	1.353	3.448	-0.845	0.726	-1.135	0.430	0.573	1.020	1.616	-0.854		
	p-value	0.812	0.128	0.274	0.104	0.332	0.037	0.176	0.001	0.398	0.468	0.257	0.667	0.567	0.308	0.106	0.393		
Croatia	coefficient	0.077	0.090	0.190	0.046	-0.059	-0.058	0.096	**0.286** **	-0.109	0.216	0.110	0.243	-0.021	-0.068	0.019	0.012	0.856	0.621
	t-statistic	0.534	0.624	1.318	0.317	-0.413	-0.403	0.669	1.985	-0.749	1.490	0.760	1.684	-0.146	-0.469	0.135	0.081		
	p-value	0.593	0.533	0.188	0.751	0.680	0.687	0.503	0.047	0.454	0.136	0.447	0.092	0.884	0.639	0.893	0.935		
Czech Republic	coefficient	-0.102	0.048	0.167	0.127	0.065	-0.049	-0.083	0.082	0.141	0.049	-0.054	**0.188** *	0.030	0.063	-0.003	-0.060	0.792	0.696
	t-statistic	-0.952	0.449	1.558	1.184	0.609	-0.453	-0.769	0.764	1.308	0.459	-0.501	1.751	0.280	0.590	-0.031	-0.562		
	p-value	0.341	0.653	0.119	0.237	0.543	0.651	0.442	0.445	0.191	0.646	0.616	0.080	0.780	0.555	0.975	0.574		
Estonia	coefficient	-0.115	0.089	0.037	0.196	-0.053	0.026	0.004	-0.040	0.138	0.279	0.055	0.203	0.163	0.104	0.298	-0.167	0.732	0.764
	t-statistic	-0.654	0.505	0.209	1.114	-0.302	0.146	0.025	-0.231	0.783	1.585	0.315	1.157	0.928	0.590	1.701	-0.952		
	p-value	0.513	0.614	0.835	0.265	0.763	0.884	0.980	0.818	0.434	0.113	0.753	0.247	0.353	0.555	0.089	0.341		
Hungary	coefficient	-0.010	-0.103	0.110	0.057	0.137	0.126	-0.082	0.174	0.206	0.213	**0.257** *	**0.328** **	0.083	0.133	-0.183	-0.214	1.242	0.227
	t-statistic	-0.063	-0.676	0.723	0.371	0.900	0.826	-0.537	1.139	1.339	1.390	1.683	2.150	0.546	0.870	-1.208	-1.404		
	p-value	0.949	0.499	0.470	0.710	0.368	0.409	0.591	0.255	0.181	0.165	0.092	0.032	0.585	0.384	0.227	0.160		
Latvia	coefficient	-0.030	0.004	0.178	0.135	0.222	-0.118	-0.066	-0.066	0.162	-0.118	0.072	0.250	0.112	0.209	0.210	0.017	0.662	0.834
	t-statistic	-0.167	0.020	1.009	0.765	1.259	-0.669	-0.373	-0.375	0.904	-0.663	0.407	1.414	0.635	1.180	1.191	0.094		
	p-value	0.867	0.984	0.313	0.445	0.208	0.504	0.709	0.708	0.366	0.507	0.684	0.157	0.526	0.238	0.234	0.925		
Lithuania	coefficient	0.003	0.076	0.104	-0.114	0.009	0.068	-0.080	0.019	0.019	-0.013	0.100	**0.246** *	**0.310** **	0.088	0.146	**-0.259** **	1.094	0.354
	t-statistic	0.023	0.573	0.792	-0.866	0.068	0.514	-0.605	0.145	0.143	-0.095	0.762	1.866	2.350	0.665	1.114	-1.962		
	p-value	0.982	0.566	0.428	0.386	0.946	0.607	0.545	0.884	0.886	0.925	0.446	0.062	0.019	0.506	0.265	0.050		
Poland	coefficient	0.006	**0.228** *	0.060	-0.061	0.010	0.121	**-0.320** **	0.047	**0.214** *	**0.253** **	0.044	**0.223** *	0.197	0.112	0.000	**-0.274** **	**1.840** **	0.022
	t-statistic	0.048	1.816	0.476	-0.489	0.077	0.961	-2.545	0.377	1.689	2.002	0.347	1.776	1.564	0.891	-0.001	-2.179		
	p-value	0.962	0.069	0.634	0.625	0.939	0.337	0.011	0.706	0.091	0.045	0.729	0.076	0.118	0.373	1.000	0.029		
Romania	coefficient	-0.083	0.028	0.093	0.002	**-0.277** *	-0.039	0.241	**0.283** *	**0.279** *	0.179	0.117	0.196	0.089	-0.044	-0.191	0.014	1.199	0.260
	t-statistic	-0.546	0.187	0.615	0.010	-1.831	-0.255	1.596	1.873	1.825	1.173	0.770	1.292	0.588	-0.292	-1.260	0.091		
	p-value	0.585	0.852	0.538	0.992	0.067	0.799	0.111	0.061	0.068	0.241	0.441	0.196	0.556	0.770	0.208	0.928		
Russia	coefficient	-0.177	0.251	0.233	0.007	**-0.393** *	-0.142	**-0.387** *	0.363	0.182	**0.550** **	0.333	**0.582** ***	0.051	0.193	-0.072	-0.299	**1.910** **	0.016
	t-statistic	-0.794	1.127	1.045	0.032	-1.761	-0.634	-1.734	1.625	0.811	2.457	1.490	2.607	0.230	0.865	-0.323	-1.339		
	p-value	0.427	0.260	0.296	0.974	0.078	0.526	0.083	0.104	0.418	0.014	0.136	0.009	0.818	0.387	0.747	0.181		
Slovakia	coefficient	0.041	-0.014	-0.020	0.055	-0.035	0.067	**-0.191** *	0.138	0.035	0.009	0.096	0.116	0.139	-0.154	0.074	0.060	0.734	0.761
	t-statistic	0.370	-0.125	-0.180	0.501	-0.315	0.608	-1.734	1.251	0.317	0.081	0.875	1.056	1.259	-1.393	0.676	0.542		
	p-value	0.712	0.900	0.857	0.616	0.753	0.543	0.083	0.211	0.751	0.936	0.382	0.291	0.208	0.164	0.499	0.588		
Slovenia	coefficient	0.043	0.076	**0.241** ***	**0.227** ***	0.005	0.046	0.046	**0.193** **	0.022	**0.186** **	**0.170** *	**0.187** **	**0.202** **	0.040	-0.138	**-0.168** *	**2.865** ***	<0.001
	t-statistic	0.497	0.875	2.768	2.610	0.055	0.523	0.533	2.219	0.253	2.128	1.956	2.146	2.316	0.455	-1.595	-1.934		
	p-value	0.620	0.382	0.006	0.009	0.956	0.601	0.594	0.027	0.801	0.033	0.051	0.032	0.021	0.649	0.111	0.053		
MSCI Europe	coefficient	**-0.166** *	-0.022	-0.011	0.036	0.092	0.152	0.041	**0.176** *	**0.255** **	0.216 **	-0.044	0.153	0.039	**-0.195** **	-0.082	-0.209 **	**2.043** ***	0.008
	t-statistic	-1.677	-0.218	-0.110	0.369	0.934	1.533	0.415	1.782	2.558	2.180	-0.446	1.545	0.399	-1.975	-0.829	-2.116		
	p-value	0.094	0.827	0.912	0.712	0.350	0.125	0.678	0.075	0.011	0.029	0.656	0.122	0.690	0.048	0.407	0.034		
MSCI World	coefficient	-0.120	-0.017	-0.073	0.037	0.047	0.077	0.066	0.051	**0.279** ***	0.069	0.011	0.094	0.004	-0.090	**-0.136** *	**-0.140** *	**1.921** ***	0.015
	t-statistic	-1.599	-0.226	-0.973	0.499	0.628	1.023	0.878	0.679	3.691	0.922	0.144	1.251	0.047	-1.194	-1.817	-1.864		
	p-value	0.110	0.821	0.331	0.618	0.530	0.307	0.380	0.497	<0.001	0.357	0.886	0.211	0.963	0.232	0.069	0.062		
MSCI Emerging Markets	coefficient	-0.093	-0.049	-0.050	0.008	-0.094	-0.002	-0.002	**0.235** **	**0.293** ***	**0.396** ***	**-0.058**	**0.185** **	0.141	-0.029	-0.091	**-0.300** ***	**3.355** ***	<0.001
	t-statistic	-0.991	-0.525	-0.529	0.087	-1.001	-0.026	-0.023	2.502	3.095	4.190	-0.611	1.971	1.503	-0.312	-0.976	-3.188		
	p-value	0.322	0.600	0.597	0.931	0.317	0.979	0.982	0.012	0.002	<0.001	0.541	0.049	0.133	0.755	0.329	0.001		

Notes: ***, **, and * indicate statistical significance for a two-tailed t-test at the one, five and ten percent level respectively.

Table 23: Test for the Turn-of-the-Month Effect during the Whole Sample Period

Test for the turn-of-the-month (TOM) effect. Third column represents the intercept in regression $R_t = \alpha + \beta D_{\text{TOM}} + e_t$, the percentage mean daily return for the rest-of-the-month (ROM) period (trading days -8 through -2 and +5 through +8). Forth column stands for the difference between the mean daily TOM return (trading days -1 through +4) and the mean daily ROM return. For each index the estimated coefficient, t-value and p-value are shown.

Country	N		ROM	TOM	F-statistic	p-value
Bulgaria	1593	coefficient	**0.173** ***	-0.069	0.458	0.499
		t-statistic	3.201	-0.677		
		p-value	0.001	0.499		
Croatia	2407	coefficient	0.013	**0.138** *	**3.282** *	0.070
		t-statistic	0.316	1.811		
		p-value	0.752	0.070		
Czech Republic	2410	coefficient	0.026	0.055	0.962	0.327
		t-statistic	0.870	0.981		
		p-value	0.384	0.327		
Estonia	2410	coefficient	0.022	0.105	1.287	0.257
		t-statistic	0.453	1.134		
		p-value	0.651	0.257		
Hungary	2410	coefficient	-0.015	**0.250** ***	**9.725** ***	0.002
		t-statistic	-0.351	3.118		
		p-value	0.725	0.002		
Latvia	2193	coefficient	0.069	-0.009	0.010	0.922
		t-statistic	1.407	-0.098		
		p-value	0.160	0.922		
Lithuania	2193	coefficient	0.036	0.039	0.307	0.579
		t-statistic	0.992	0.554		
		p-value	0.321	0.579		
Poland	2410	coefficient	-0.004	**0.159** **	**5.774** **	0.016
		t-statistic	-0.104	2.403		
		p-value	0.917	0.016		
Romania	2254	coefficient	0.009	**0.202** **	**6.377** **	0.012
		t-statistic	0.218	2.525		
		p-value	0.828	0.012		
Russia	2410	coefficient	-0.061	**0.464** ***	**15.554** ***	<0.001
		t-statistic	-0.993	3.944		
		p-value	0.321	<0.001		
Slovakia	2410	coefficient	0.019	0.060	1.071	0.301
		t-statistic	0.627	1.035		
		p-value	0.531	0.301		
Slovenia	2410	coefficient	**0.049** **	**0.103** **	**4.972** **	0.026
		t-statistic	2.043	2.230		
		p-value	0.041	0.026		
MSCI Europe	2410	coefficient	-0.025	**0.176** ***	**11.332** ***	0.001
		t-statistic	-0.905	3.366		
		p-value	0.366	0.001		
MSCI World	2410	coefficient	-0.028	**0.128** ***	**10.507** ***	0.001
		t-statistic	-1.345	3.241		
		p-value	0.179	0.001		
MSCI Emeging Markets	2410	coefficient	**-0.053** **	**0.263** **	**27.999** ***	<0.001
		t-statistic	-2.027	5.291		
		p-value	0.043	<0.001		

Notes: ***, **, and * indicate statistical significance for a two-tailed t-test at the one, five and ten percent level respectively.

Table 24: Turn-of-the-Month Effect during the First Sub-Period 1997-2000

Third column represents the intercept in regression $R_t = \alpha + \beta D_{TOM} + e_t$, the percentage mean daily return for the rest-of-the-month (ROM) period (trading days -8 through -2 and +5 through +8). Forth column stands for the difference between the mean daily TOM return (trading days -1 through +4) and the mean daily ROM return. For each index the estimated coefficient, t-value and p-value are shown.

Country		ROM	TOM	F-statistic	p-value
Bulgaria	coefficient	0.117	0.077	0.009	0.926
	t-statistic	0.291	0.094		
	p-value	0.773	0.926		
Croatia	coefficient	-0.118	**0.381** **	**4.838** **	0.028
	t-statistic	-1.308	2.200		
	p-value	0.191	0.028		
Czech Republic	coefficient	-0.033	0.021	0.039	0.843
	t-statistic	-0.592	0.198		
	p-value	0.554	0.843		
Estonia	coefficient	-0.022	0.125	0.294	0.588
	t-statistic	-0.182	0.542		
	p-value	0.855	0.588		
Hungary	coefficient	-0.128	**0.487** ***	**7.250** ***	0.007
	t-statistic	-1.345	2.693		
	p-value	0.179	0.007		
Latvia	coefficient	-0.105	0.173	0.770	0.380
	t-statistic	-1.020	0.878		
	p-value	0.308	0.380		
Lithuania	coefficient	-0.019	0.094	0.430	0.512
	t-statistic	-0.247	0.656		
	p-value	0.805	0.512		
Poland	coefficient	-0.084	**0.293** **	**4.322** **	0.038
	t-statistic	-1.138	2.079		
	p-value	0.256	0.038		
Romania	coefficient	-0.152	0.188	1.081	0.299
	t-statistic	-1.612	1.040		
	p-value	0.107	0.299		
Russia	coefficient	-0.301	**0.855** ***	**9.825** ***	0.002
	t-statistic	-2.097	3.134		
	p-value	0.036	0.002		
Slovakia	coefficient	-0.081	0.133	1.364	0.243
	t-statistic	-1.346	1.168		
	p-value	0.179	0.243		
Slovenia	coefficient	0.001	**0.171** *	**3.557** *	0.060
	t-statistic	0.030	1.886		
	p-value	0.976	0.060		
MSCI Europe	coefficient	-0.028	**0.231** ***	**7.721** ***	0.006
	t-statistic	-0.643	2.779		
	p-value	0.520	0.006		
MSCI World	coefficient	-0.030	**0.162** **	**5.830** **	0.016
	t-statistic	-0.845	2.414		
	p-value	0.398	0.016		
MSCI Emeging Markets	coefficient	**-0.158** ***	**0.334** ***	**13.268** ***	<0.001
	t-statistic	-3.281	3.643		
	p-value	0.001	<0.001		

Notes: ***, **, and * indicate statistical significance for a two-tailed t-test at the one, five and ten percent level respectively.

Table 25: Turn-of-the-Month Effect during the Second Sub-Period 2001-2004

Third column represents the intercept in regression $R_t = \alpha + \beta D_{TOM} + e_t$, the percentage mean daily return for the rest-of-the-month (ROM) period (trading days -8 through -2 and +5 through +8). Forth column stands for the difference between the mean daily TOM return (trading days -1 through +4) and the mean daily ROM return. For each index the estimated coefficient, t-value and p-value are shown.

Country		ROM	TOM	F-statistic	p-value
Bulgaria	coefficient	**0.215** **	-0.115	0.459	0.498
	t-statistic	2.401	-0.677		
	p-value	0.017	0.498		
Croatia	coefficient	0.041	0.042	0.173	0.677
	t-statistic	0.768	0.416		
	p-value	0.442	0.677		
Czech Republic	coefficient	0.092	-0.014	0.025	0.874
	t-statistic	1.965	-0.158		
	p-value	0.050	0.874		
Estonia	coefficient	**0.109** **	0.058	0.391	0.532
	t-statistic	2.245	0.625		
	p-value	0.025	0.532		
Hungary	coefficient	-0.129	**0.486** ***	**7.284** ***	0.007
	t-statistic	-1.354	2.699		
	p-value	0.176	0.007		
Latvia	coefficient	**0.182** **	**-0.269** *	**3.411** *	0.065
	t-statistic	2.379	-1.847		
	p-value	0.018	0.065		
Lithuania	coefficient	0.095	-0.074	0.437	0.509
	t-statistic	1.618	-0.661		
	p-value	0.106	0.509		
Poland	coefficient	0.023	0.064	0.520	0.471
	t-statistic	0.503	0.721		
	p-value	0.615	0.471		
Romania	coefficient	**0.145** ***	0.103	1.123	0.290
	t-statistic	2.834	1.060		
	p-value	0.005	0.290		
Russia	coefficient	0.030	**0.260** *	**3.085** *	0.079
	t-statistic	0.380	1.756		
	p-value	0.704	0.079		
Slovakia	coefficient	**0.124** **	-0.021	0.047	0.828
	t-statistic	2.454	-0.217		
	p-value	0.014	0.828		
Slovenia	coefficient	**0.079** **	0.040	0.320	0.571
	t-statistic	2.128	0.566		
	p-value	0.034	0.571		
MSCI Europe	coefficient	-0.080	**0.204** **	**4.388** **	0.036
	t-statistic	-1.566	2.095		
	p-value	0.118	0.036		
MSCI World	coefficient	**-0.075** *	**0.171** **	**5.230** **	0.022
	t-statistic	-1.896	2.287		
	p-value	0.058	0.022		
MSCI Emeging Markets	coefficient	-0.045	**0.259** ***	**12.195** ***	0.001
	t-statistic	-1.145	3.492		
	p-value	0.252	0.001		

Notes: ***, **, and * indicate statistical significance for a two-tailed t-test at the one, five and ten percent level respectively.

Table 26: Turn-of-the-Month Effect during the Third Sub-Period 2005-2008

Third column represents the intercept in regression $R_t = \alpha + \beta D_{TOM} + e_t$, the percentage mean daily return for the rest-of-the-month (ROM) period (trading days -8 through -2 and +5 through +8). Forth column stands for the difference between the mean daily TOM return (trading days -1 through +4) and the mean daily ROM return. For each index the estimated coefficient, t-value and p-value are shown.

Country		ROM	TOM	F-statistic	p-value
Bulgaria	coefficient	**0.114** **	-0.024	0.063	0.801
	t-statistic	2.296	-0.252		
	p-value	0.022	0.801		
Croatia	coefficient	**0.115** **	-0.028	0.100	0.752
	t-statistic	2.446	-0.316		
	p-value	0.015	0.752		
Czech Republic	coefficient	0.012	**0.184** *	**3.403** *	0.066
	t-statistic	0.224	1.845		
	p-value	0.823	0.066		
Estonia	coefficient	-0.024	0.110	1.371	0.242
	t-statistic	-0.484	1.171		
	p-value	0.629	0.242		
Hungary	coefficient	0.068	0.094	0.605	0.437
	t-statistic	1.068	0.778		
	p-value	0.286	0.437		
Latvia	coefficient	0.077	0.142	0.970	0.325
	t-statistic	1.008	0.985		
	p-value	0.314	0.325		
Lithuania	coefficient	0.015	0.115	1.072	0.301
	t-statistic	0.248	1.035		
	p-value	0.804	0.301		
Poland	coefficient	0.062	0.131	1.516	0.219
	t-statistic	1.103	1.231		
	p-value	0.270	0.219		
Romania	coefficient	-0.013	**0.293** **	**4.510** **	0.034
	t-statistic	-0.176	2.124		
	p-value	0.861	0.034		
Russia	coefficient	**0.122** *	**0.231** *	**2.736** *	0.099
	t-statistic	1.658	1.654		
	p-value	0.098	0.099		
Slovakia	coefficient	0.016	0.062	0.583	0.446
	t-statistic	0.365	0.763		
	p-value	0.715	0.446		
Slovenia	coefficient	0.071	0.089	1.408	0.236
	t-statistic	1.803	1.187		
	p-value	0.072	0.236		
MSCI Europe	coefficient	0.050	0.080	0.808	0.369
	t-statistic	1.076	0.899		
	p-value	0.282	0.369		
MSCI World	coefficient	0.036	0.040	0.446	0.504
	t-statistic	1.160	0.668		
	p-value	0.246	0.504		
MSCI Emeging Markets	coefficient	0.064	**0.209** **	**4.946** **	0.026
	t-statistic	1.300	2.224		
	p-value	0.194	0.026		

Notes: ***, **, and * indicate statistical significance for a two-tailed t-test at the one, five and ten percent level respectively.

Annex 4: Tests for the Halloween Effect

Table 27: Tests for the Halloween Effect during the Whole Sample Period

Monthly mean returns and standard deviations as percentages. Sixth column represents the intercept in regression $R_t = c + \alpha_1 D_t c + e_t$, and $R_t = c + \alpha_1 D_t + \alpha_2 J_t + e_t$, the monthly percentage mean return for the May to October period. Seventh column stands for the difference between the mean November-April return and the mean monthly May- October return without the adjustment for the January effect. Consequently p-value of regressions F-statistic is reported. Ninth column stands for the α_1 dummy, the difference between the mean November-April monthly return with and adjusted Halloween dummy (value zero in January and one in the other November through April months) in regression $R_t = c + \alpha_1 D_t + \alpha_2 J_t + e_t$. Tenth column presents the α_2 dummy, the difference between the mean January and monthly May to October return. Consequently p-value of regressions F-statistic is reported.

Country	N	Mean (%)	Std. Dev. (%)		May-October	November-April dummy (no January effect)	F-statistic p-value (no January effect)	November-April dummy excl. January	November-April January dummy	F-statistic p-value adjusted for January effect
Bulgaria	88	3.05	7.97	coeffcient	**4.381** ***	-2.445	0.155	-2.543	-1.990	0.361
				t-statistic	3.573	-1.434		-1.412	-0.646	
				p-value	0.001	0.155		0.162	0.520	
Croatia	134	1.42	9.45	coeffcient	-0.073	**2.942** *	**0.071** *	2.202	**6.393** **	**0.074** *
				t-statistic	-0.064	1.818		1.299	2.183	
				p-value	0.949	0.071		0.196	0.031	
Czech Republic	134	0.66	6.75	coeffcient	0.234	0.837	0.475	0.727	1.348	0.744
				t-statistic	0.281	0.717		0.590	0.633	
				p-value	0.779	0.475		0.556	0.528	
Estonia	134	1.05	11.05	coeffcient	-0.963	**3.977** **	**0.037** **	**3.731** *	5.127	0.105
				t-statistic	-0.718	2.110		1.877	1.493	
				p-value	0.474	0.037		0.063	0.138	
Hungary	134	1.09	8.74	coeffcient	0.096	1.953	0.197	1.542	3.869	0.307
				t-statistic	0.090	1.297		0.973	1.413	
				p-value	0.929	0.197		0.332	0.160	
Latvia	122	0.50	9.04	coeffcient	-0.328	1.708	0.302	1.555	2.488	0.563
				t-statistic	-0.280	1.036		0.897	0.801	
				p-value	0.780	0.302		0.371	0.425	
Lithuania	122	0.81	8.23	coeffcient	-0.529	**2.877** *	**0.053** *	2.490	**4.851** *	0.108
				t-statistic	-0.506	1.958		1.616	1.755	
				p-value	0.613	0.053		0.109	0.082	
Poland	134	0.69	7.53	coeffcient	0.028	1.304	0.318	0.954	2.937	0.433
				t-statistic	0.030	1.002		0.696	1.241	
				p-value	0.976	0.318		0.487	0.217	
Romania	134	1.36	10.55	coeffcient	1.666	-0.551	0.774	-1.762	5.288	0.127
				t-statistic	1.214	-0.288		-0.890	1.536	
				p-value	0.227	0.774		0.375	0.127	
Russia	134	1.52	15.28	coeffcient	-1.261	**5.486** **	**0.037** **	**6.041** **	2.897	**0.093** *
				t-statistic	-0.679	2.105		2.200	0.611	
				p-value	0.498	0.037		0.030	0.542	
Slovakia	134	0.65	6.47	coeffcient	0.901	-0.496	0.659	-0.112	-2.290	0.521
				t-statistic	1.127	-0.442		-0.095	-1.124	
				p-value	0.262	0.659		0.924	0.263	
Slovenia	134	1.40	5.40	coeffcient	**1.523** **	-0.241	0.798	-1.045	**3.514** *	**0.027** **
				t-statistic	2.284	-0.257		-1.087	2.116	
				p-value	0.024	0.798		0.279	0.036	
MSCI Europe	134	0.32	4.56	coeffcient	-0.215	1.053	0.182	**1.597** *	-1.486	**0.042** **
				t-statistic	-0.384	1.341		1.961	-1.056	
				p-value	0.701	0.182		0.052	0.293	
MSCI World	134	0.15	4.00	coeffcient	-0.265	0.815	0.239	1.069	-0.371	0.264
				t-statistic	-0.540	1.182		1.476	-0.297	
				p-value	0.590	0.239		0.142	0.767	
MSCI Emerging Markets	134	0.21	7.04	coeffcient	-0.853	**2.091** *	**0.086** *	**2.277** *	1.223	0.205
				t-statistic	-0.992	1.732		1.788	0.556	
				p-value	0.323	0.086		0.076	0.579	

Notes: ***, **, and * indicate statistical significance for a two-tailed t-test at the one, five and ten percent level respectively.

Table 28: Test for the Mean Variance Efficiency of Stock Indices

Estimation for the regression $R_{pt} - R_{ft} = \alpha + \beta(R_{mt} - R_{ft}) + e_t$, where α describes how much the annual return of the Halloween strategy has exceeded the return of a corresponding index portfolio and β is a measure of volatility of a Halloween strategy in relation to the respective market indices. Regressions are based on annual observations over the period 1997-2007.

Country		α	β	F-statistic	p-value
Bulgaria	coefficient	**-16.717** *	**0.810** ***	**27.444** ***	0.003
	t-value	-2.473	5.239		
	p-value	0.056	0.003		
Croatia	coefficient	12.934	0.393	1.098	0.322
	t-value	1.669	1.048		
	p-value	0.129	0.322		
Czech Republic	coefficient	6.585	**0.510** **	**8.801** **	0.016
	t-value	1.536	2.967		
	p-value	0.159	0.016		
Estonia	coefficient	**21.812** ***	**0.638** ***	**24.829** ***	0.001
	t-value	3.531	4.983		
	p-value	0.006	0.001		
Hungary	coefficient	**12.049** *	0.285	1.796	0.213
	t-value	2.214	1.340		
	p-value	0.054	0.213		
Latvia	coefficient	8.453	**0.364** *	**4.614** *	0.069
	t-value	1.396	2.148		
	p-value	0.205	0.069		
Lithuania	coefficient	8.952	**0.318** *	**4.209** *	0.079
	t-value	1.799	2.052		
	p-value	0.115	0.079		
Poland	coefficient	**10.079** **	0.214	2.000	0.191
	t-value	2.758	1.414		
	p-value	0.022	0.191		
Romania	coefficient	**-13.125** ***	**0.985** ***	**101.569** ***	<0.001
	t-value	-4.103	10.078		
	p-value	0.005	<0.001		
Russia	coefficient	**23.816** *	**0.446** ***	**12.191** ***	0.007
	t-value	2.175	3.492		
	p-value	0.058	0.007		
Slovakia	coefficient	-1.970	**0.421** *	**4.977** *	0.053
	t-value	-0.298	2.231		
	p-value	0.773	0.053		
Slovenia	coefficient	-1.809	**0.691** ***	**23.888** ***	0.001
	t-value	-0.555	4.888		
	p-value	0.592	0.001		
MSCI Europe	coefficient	**8.106** ***	**0.389** **	**9.941** **	0.012
	t-value	3.443	3.153		
	p-value	0.007	0.012		
MSCI World	coefficient	**4.656** *	**0.437** ***	**10.886** ***	0.009
	t-value	2.106	3.299		
	p-value	0.064	0.009		
MSCIEmerging Markets	coefficient	**11.658** *	**0.255** *	**4.654** *	0.059
	t-value	3.169	2.157		
	p-value	0.011	0.059		

Notes: ***, **, and * indicate statistical significance for a two-tailed t-test at the one, five and ten percent level respectively.